4.4 Geology, Soils, and Seismicity

This section presents a discussion of geologic, soils, and seismic hazards and impacts on development associated with implementation of the 2007 Monterey General Plan. The topics discussed in this section overlap those discussed in other sections of this EIR, including the erosion and groundwater quality discussion in Section 4.3, Water Resources.

4.4.1 Abstract

Monterey County is located in one of the most seismically active regions in the world. The San Andreas Fault traverses the eastern portion of the County, and many areas therein are susceptible to seismic hazards such as strong ground shaking, liquefaction, and earthquake-induced landslides. In addition, erosion hazards are present in the agricultural areas of the Salinas and Pajaro Valleys. Implementation of the 2007 General Plan would result in development and land use activities on individual lots of record and agricultural areas throughout the County. However, all impacts related to geology, soils, and seismicity would be less than significant with mitigation and compliance with federal, state, and local regulations.

4.4.2 Existing Conditions

4.4.2.1 Regional Geology

Much of the unique landscape and resources of Monterey County have their origins in the County's geologic history. Monterey County lies within the California Coast Ranges geomorphic and physiographic province, a region dominated by active tectonics astride the margin between the Pacific and North American tectonic plates. Regional tectonic forces generate an estimated relative motion between the North American and Pacific plates of approximately 2 inches per year. Over time, these forces have created the varied mountainous, valley, and fault-bound blocks seen in Monterey County today. Present-day plate motion is dominantly right-lateral strike slip, with a minor component of convergence or compression, especially along the Big Sur coastline. "Right-lateral strike slip motion" refers to a rightward shift along the fault boundary when viewing toward the fault.

One hundred million years ago, motion was dominantly convergent when the Pacific Plate was being subducted beneath the North American Plate. This subducted oceanic crustal material was metamorphosed under high pressure to become the Franciscan Complex, one of the oldest rock types underlying Monterey County. Another even older block of rocks, known as the Salinian

block, has been rafted northward along the San Andreas Fault. These rocks originated as marine bed on the continental shelf hundreds of miles to the south of their present location, probably west of the Mojave Desert in southern California. During the Miocene Epoch (5 to 24 million years ago), the Pacific and North American plates shifted the direction of their major movement relative to one another, and instead of a convergent margin, the plate boundary became a transform boundary with lateral movement similar to that occurring along the present-day San Andreas Fault system. Movement along the ancient fault system caused the Salinian rocks to be carried northward—after undergoing folding and intrusion by granitic rocks. Thus, the two major rock types underlying Monterey County, the Salinian and Franciscan, both were created as a result of interaction between the Pacific and North American plates.

Plate motion continues today and is manifested along the County's various fault systems. Two faults considered active with evidence of historic or recent movement are the San Andreas and San Gregorio Faults, which form the eastern and western boundaries of the Salinian block. Tectonic movement in the region has resulted in a variety of active fault types. Uplift along faults is largely responsible for the formation of the Coast Ranges, including the Santa Lucia and Gabilan Ranges. In Monterey County, the uplift that formed the Coast Ranges was much more rapid than in other parts of the state. The dramatic cliffs of the Big Sur Coast and steep slopes of the Santa Lucia Mountains are products of this rapid uplift during the Pliocene epoch, more than a million years ago.

The rapid uplift stimulated by active faulting accelerated other physiographic processes that formed major geologic features evident today. Rapid erosion and deposition of soil from the uplifted mountains formed broad alluvial fans of well-drained, nutrient-rich soil. This process occurred over several tens of millions of years. During the Pleistocene era, the sea level fluctuated repeatedly in response to climate changes that formed glaciers in other parts of the world. As the sea level changed, marine sediments were deposited beneath what later became the floor of the Salinas Valley. The interplay of two fundamentally different depositional processes—the erosion and deposition of alluvial material when the sea level retreated, and the deposition of marine layers when the sea advanced—created a complexity of soils and substrate materials. These processes are responsible for what we now consider the valuable agricultural soils of the Salinas Valley. They also formed the sandy stream terrace deposits along both sides of the Salinas Valley.

The changes in sea level created the 180- and 400-foot aquifers and intervening clay layers that separate them beneath the Salinas Valley. Marine deposits constitute the impermeable clay layer that confines the aquifer in the northern Salinas Valley and is the reason the groundwater table is not recharged from the Salinas River north of Chualar.

It was during this same era of fluctuating sea levels and accelerated erosion that Monterey Canyon was formed. Millions of years ago, when the sea had retreated, streams from the ancestral Gabilan Mountains carved the deep canyon. The sea later returned to submerge the canyon in Monterey Bay. The deep

submarine canyon is largely responsible for the extraordinary biodiversity of Monterey Bay. Other submerged features in Monterey Bay are the gravel ledges and rock bars known to fishermen as Italian Ledge and Portuguese Ledge, which are renowned for their abundance of sea life. These features formed as gravel beds and were uplifted by the Monterey Bay Fault zone, which extends from Monterey Bay into upper Carmel Valley.

Uplift resulting from convergence of the Pacific and North America plates has occurred several times in geologic history, but the uplift of the Santa Lucia and Gabilan Mountains to their present position probably occurred during the last 400,000 years. A series of wave-cut, marine terraces around the Monterey Peninsula and south along Highway 1, together with a series of fluvial terraces that flank the Carmel River, record the uplift of the Santa Lucia Range in the last million years.

Active geologic processes are still modifying the land throughout the County. These processes include rivers eroding and depositing sediment, the formation of dunes by wind-borne sand, and landslides in the mountains and hills.

4.4.2.2 Seismicity

Faulting

Faults form in rocks when stresses overcome the internal strength of the rock, resulting in a fracture. Large faults develop in response to large regional stresses operating over a long time, such as those stresses caused by the relative displacement between the North American and Pacific tectonic plates. According to the elastic rebound theory, these stresses cause strain to build up in the earth's crust until enough strain has built up to exceed the strength along a fault and cause a brittle failure. The slip between the two stuck plates or coherent blocks generates an earthquake. Following an earthquake, strain will build again until another earthquake. The magnitude of slip is related to the maximum allowable strain that can be built up along a particular fault segment. The greatest buildup in strain due to the largest relative motion between tectonic plates or fault blocks over the longest time will generally produce the largest earthquakes. The distribution of these earthquakes is a study of much interest for both hazard prediction and the study of active deformation of the earth's crust. Deformation is a complex process and strain due to tectonic forces is not only accommodated through faulting but also through folding, uplift, and subsidence, which can be gradual or in direct response to earthquakes.

Faults are mapped to determine earthquake hazards since they are where earthquakes tend to recur. A historical plane of weakness is more likely to fail under stress and strain than a previously unbroken block of crust. Faults are therefore a prime indicator of past seismic activity, and faults with recent activity are presumed to be the best candidates for future earthquakes. However, since slip is not always accommodated by faults that intersect the surface along traces, and since the orientation of stresses and strains in the crust can shift, predicting

the location of future earthquakes is complicated. Earthquakes sometimes occur in areas with previously undetected faults or along faults previously thought inactive.

In California, a system has been developed by the California Geological Survey and U.S. Geological Survey (USGS) to assess the activity of faults. Under this system, faults are classified active if they have ruptured in the last 11,000 years or within the Holocene period. Other faults are considered inactive.

There are several fault maps for Monterey County. The Fault Activity Map of California shows nearly all faults that are considered active, potentially active, or inactive (Exhibit 4.4.1). The Alquist-Priolo Earthquake Fault Zones Maps show faults that are considered active. In Monterey County, all of the mapped onshore active fault traces lie along the main San Andreas Fault. The southeast County is an active earthquake area with a regular cycle of moderately large earthquakes. Five earthquakes of magnitude 6.0 or greater on the Richter scale have occurred on this segment of the fault since 1901. Fortunately, this area has only a small population, with only the small town of Parkfield containing land within the Earthquake Fault Zone (EFZ).

Other onshore faults in Monterey County include the Berwick, Seaside-Chupines, Cypress Point, Gabilan Creek, Garrapata, Harper, Hatton Canyon, Jolon, Nacimiento, Navy-Tularcitos, Palo Colorado, Reliz, Rinconada, Rocky Creek, San Gregorio, Sylvan, Tularcitos, and Zayante-Vergeles. No major earthquakes have occurred on these faults during the past 100 years.

A final class of faults is those mapped offshore. Since these faults are offshore, they are not a risk for causing a land rupture but could cause seismic shaking and possibly trigger a tsunami. A tsunami may be triggered by an underwater landslide in response to seafloor deformation or may occur from the actual fault rupture motion. This component of risk is separate from the risk of a tsunami generated elsewhere around the Pacific Rim from a large earthquake, such as the earthquake that caused the devastating 2004 tsunami in Sumatra, but the impact could be similar.

In Monterey County, two earthquakes have caused recorded tsunami run-up heights that exceeded 1 meter. The 1960 Chilean Earthquake of estimated magnitude 9.5 (largest ever recorded) caused a 1.1-meter run-up-and killed one person, while the slightly smaller but nearer 1964 Alaska earthquake of magnitude 9.2 caused a 1.4-meter run up and significant boat damage at harbors in the Monterey Bay area. According to the State of California Seismic Safety Commission Report released in December 2005, the maximum estimated run-up height in Monterey Bay is 1 to 2 meters, while 2 to 5 meters is anticipated along the Big Sur Coast. Perhaps the most likely source for a significant tsunami exceeding 1 meter in run-up height would be from a rupture along the Cascadia Subduction zone in the Pacific Northwest, which evidence indicates has not had a major rupture since 1700 and could produce an earthquake in the Richter magnitude 9.0 range. Various tsunami-generating scenarios have been examined by the USGS, the California Geologic Survey (CGS), the California Seismic

Safety Commission, and universities—including the University of Southern California Tsunami Research Center. This research is being used to update the current warning system. The Monterey County Office of Emergency Services is currently examining the updated tsunami research, particularly that completed by USGS and the University of Southern California, to establish an effective community notification or alert system for evacuation. This would be implemented in coordination with the West Coast and Alaska tsunami warning system, which is the primary alert system in the region. Targeted study areas are those that lie below 5 and 10 meters above mean sea level, since these are considered most at risk from inundation by a major tsunami.

Earthquakes

The entire California Coast and Coast Ranges area is prone to earthquakes, including Monterey County. A Richter magnitude 6.0 earthquake that struck near the Town of Parkfield in 2004 caused only minor damage; however, a magnitude 6.5 earthquake near the more populous area of San Simeon in 2003 in neighboring San Luis Obispo County caused major damage to unreinforced masonry structures and killed two people in Paso Robles. Based on history, the probability of such an earthquake occurring in the next few decades that is equal or larger in magnitude in Monterey County is quite likely.

Table 4.4-1 summarizes the year, epicenter, and magnitude of major historical quakes that have affected Monterey County since 1900. Earthquake damage from some of these historical quakes has been significant. The Preliminary Report of the State Earthquake Commission, dated May 31, 1906, described the damage that occurred in Monterey County from the April 1906 San Francisco quake:

> Along the banks of the Salinas River and extending from Salinas to the vicinity of Gonzales, so far as our reports at present show, the bottom lands were more severely ruptured, fissured, and otherwise deformed than in any other portion of the State. The Spreckels Sugar Mill, situated on the banks of the river, suffered more severely probably than any other steel structure in the State.

Other damage from the 1906 earthquake included destruction of the wharf at Moss Landing and destruction of the Hotel Del Monte in Monterey.

Table 4.4-1. Major Historical Earthquakes in the Region

Year	Epicenter	Richter Magnitude at Epicenter
1901	Parkfield	6.4
1906	San Francisco	8.3
1922	Parkfield	6.3
1934	Parkfield	6.0
1966	Parkfield	6.6
1983	Coalinga	6.5
1984	Morgan Hill	6.1
1989	Loma Prieta	7.1
2003	San Simeon	6.5
2004	Parkfield	6.0

Source: U.S. Geological Survey 2006.

While Richter magnitude provides a useful measure of comparison between earthquakes, the Moment magnitude is more widely used for scientific comparison since it accounts for the actual slip that generated the earthquake. Actual damage is due to the propagation of seismic or ground waves from initial failure, and the intensity of shaking is as much related to earthquake magnitude as the condition of underlying materials. Loose materials tend to amplify ground waves, while hard rock can quickly attenuate them, causing little damage to overlying structures. For this reason, the Modified Mercalli Intensity (MMI) Scale provides a useful qualitative assessment of earthquake intensity. The MMI Scale is shown in Table 4.4-2.

Future Earthquake Probability

Both the USGS and CGS are conducting active research on earthquake probabilities throughout California. While much effort has been focused on the San Francisco Bay Area, there are several active projects in Monterey County, such as the San Andreas Fault Observatory at Depth (SAFOD) project near Parkfield, in the southeastern portion of the County. In 2005, a borehole penetrated to a depth of over 13,000 feet in order to install sensitive monitoring equipment used to record the future pattern and slip from earthquakes at depth.

Table 4.4-2. Modified Mercalli Intensity of Earthquakes

Richter Scale Magnitude	Modified Mercalli Intensity	Effects of Intensity
0.1–0.9	I	Not felt except by a very few under especially favorable circumstances.
1.0–2.9	II	Felt by only a few persons at rest, especially on upper floors of building. Delicately suspended objects may swing.
3.0–3.9	III	Felt quite noticeable in doors, especially on upper floors of building, but many people do not recognize it as an earthquake. Standing cars may rock slightly. Vibration like passing a truck. Duration estimated.
4.0–4.5	IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensations like heavy truck striking building. Standing cars rocked noticeably.
4.6–4.9	V	Felt by nearly everyone, many awakened. Some dishes, windows, and so on broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
5.0–5.5	VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of faller plaster and damaged chimneys. Damage slight.
5.6–6.4	VII	Everyone runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars.
6.5–6.9	VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monument walls, and heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving in cars disturbed.
7.0–7.4	IX	Damage considerable in specially designed structures; well-designed frame strictures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
7.5–7.9	X	Some well-built structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Railway lines bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks.
8.0–8.4	XI	Few, if any masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and landslips in soft ground. Rails bent gently.
8.5 ≤	XII	Total damage. Waves seen on ground. Lines of sight and level distorted. Objects thrown into the air.

Source: Abridged from *The Severity of an Earthquake, USGS General Interest Publication.* Available online from the U.S. Geological Service at: http://pubs.usgs.gov/gip/earthq4/severitygip.html (U.S. Government Printing Office Number 1989-288-913).

The most commonly cited document for earthquake planning is the Probabilistic Seismic Hazard Assessment, which addresses the probability of seismic shaking since that is the primary hazard from earthquakes.

Several seismic sources are present in the County, including several that are not considered at risk from fault rupture under the Alquist-Priolo Earthquake Fault Zoning Act (A-P Act). Documented seismic sources are the Rinconada, San Gregorio (Palo Colorado), Monterey Bay-Tularcitos, Hosgri, and San Andreas Faults.

The present analysis of seismic data indicates that the highest-magnitude earthquakes that would generate the strongest seismic shaking are expected to occur on the San Andreas Fault since this has the highest slip rates and rupture lengths. Other faults with high slip and rupture lengths are the southern segment of the San Gregorio and Hosgri Faults. Both the Rinconada and Monterey Bay-Tularcitos Faults have much lower slip rates and are therefore not expected to produce as large an earthquake as the other faults. Evidence indicates that the San Andreas Fault is the dominant seismic source in the region. Based on this assessment, the strongest peak ground accelerations with a 10%probability of being exceeded in 50 years that are greater than 80% of the acceleration due to gravity are along the San Andreas Fault in the Parkfield area. Such ground acceleration would likely generate shaking of a Mercalli Intensity level of at least IX. Peak ground accelerations are predicted to be less elsewhere, with the strongest peak ground accelerations in the more populous North County between Salinas and San Juan Bautista, where peak ground acceleration as high as 70% of gravity is predicted. While these areas are predicted to have the strongest ground shaking, this assessment does not consider the amplification of seismic waves by shallow surface materials, which could be considerable in looser liquefiable materials far from an earthquake. This hazard is addressed separately under the topics of unstable geologic materials, liquefaction, and other secondary seismic hazards.

4.4.2.3 Geologic Hazards

Geologic hazards pose a substantial danger to property and human safety, and are present due to the risk of naturally occurring geologic events and processes impacting human development. Therefore, the hazard is influenced by the conditions of human development as much as by the frequency and distribution of major geologic events. From a planning point of view, these hazards are potential constraints on the intended use of the land. By analyzing these constraints, the risks can be assessed and may be mitigated to an acceptable level.

Billions of dollars and hundreds of lives have been lost due to geologic hazards in California, many of which are present in Monterey County. Common geologic hazards present in Monterey County include ground rupture along faults, strong seismic shaking, liquefaction, and slope failure.

Fault Rupture

Fault rupture is a seismic hazard that affects structures sited above an active fault. The hazard from fault rupture is the movement of the ground surface along a fault during an earthquake. Typically, this movement takes place during the short time of an earthquake but can also occur slowly over many years in a process known as "creep." The only known creeping fault in the County is the part of the San Andreas between San Juan Bautista and Parkfield. Most structures and underground utilities cannot accommodate the surface displacements of several inches to several feet commonly associated with fault rupture or creep.

In response to the severe fault rupture damage of structures by the 1971 San Fernando earthquake, the State of California enacted the Alquist-Priolo Earthquake Fault Zoning Act in 1972. This act required the State Geologist to delineate EFZs along known active faults with a relatively high potential for ground rupture. Faults that are zoned under the A-P Act must meet the strict definition of being sufficiently active and well-defined for inclusion as an EFZ. Properties within EFZs are subject to state regulations that include prohibiting structures for human occupancy being sited within 50 feet of an active fault, requiring geologic reports addressing surface fault hazard, and geologic review of fault reports, among other provisions. Based on fault investigations and evidence of past rupture, the only state-designated EFZs in the County are along the San Andreas Fault.

Ground rupture or cracking outside a mapped active fault trace that is caused from seismic shaking, settlement, or other motion triggered by earthquakes is common. Following the 1989 Loma Prieta earthquake, major ground cracking occurred in the Santa Cruz Mountains, especially along ridgetops; this phenomenon was due to the propagation of seismic waves and probably to differential settlement and lurch cracking.

Ground Shaking

As previously mentioned, strong ground or seismic shaking is a major hazard in the County. Exhibit 4.4.2 depicts predicted peak seismic shaking intensity throughout the County (shaking in percent gravity = "g"). Monterey County is subject to very strong (0.3–0.6 g) to severe (greater than 0.6 g) shaking from the San Andreas, San Gregorio, and Reliz/Rinconada Faults. The entire County is within Seismic Zone 4, considered the most seismically active zone in the United States based on the 2001 California Building Code (adopted by Monterey County) and the 1997 Uniform Building Code. The severity of ground shaking depends on several variables, such as earthquake magnitude, epicenter distance, local geology, thickness and seismic wave-propagation properties of unconsolidated materials, groundwater conditions, and topographic setting. Consequently, the hazard from ground shaking is most severe in areas near the San Andreas Fault and in the unconsolidated alluvial areas of the County such as the Salinas and Carmel Valleys.

The most common type of damage from ground shaking is structural damage to buildings, which can range from cosmetic stucco cracks to total collapse. The overall level of structural damage from a nearby large earthquake would likely be moderate to heavy, depending on the characteristics of the earthquake, the type of ground, and the condition of the building. Besides damage to buildings, strong ground shaking can cause severe damage by falling objects such as bookcases or water heaters, or broken water or gas pipes. In industrial settings, chemical spills are a serious potential hazard. Fire and explosions resulting from ruptured gas pipes are also major hazards associated with strong ground shaking.

The ability to predict which areas will shake the strongest is vital to building design, emergency management, and analysis of related hazards such as liquefaction and earthquake-induced landslides. Although it is not possible to predict the exact level of shaking at a site, it is feasible to assess what level of ground shaking is likely to occur in a given time period.

The most common level of ground shaking used in designing residential and commercial buildings is the design basis ground motion, which has a seismic shaking level (peak ground acceleration) with a 10% chance of being exceeded in 50 years. Expressed another way, this level of ground motion has a 1 in 475 chance of being exceeded each year. Public schools, hospitals, and essential services buildings are designed to resist the upper-bound earthquake, which has a 10% chance of being exceeded in 100 years or a 1 in 949 chance of being exceeded each year.

Liquefaction

Liquefaction is a process in which sediments below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. Liquefaction is restricted to certain geologic and hydrologic environments, primarily recently deposited sand and silt in areas with high groundwater levels. The process of liquefaction involves seismic waves passing through saturated granular layers, distorting the granular structure and causing the particles to collapse. This causes the granular layer to behave temporarily as a viscous liquid rather than a solid, resulting in liquefaction.

Liquefaction can cause the soil beneath a structure to lose strength, which may result in the loss of foundation-bearing capacity. This loss of strength commonly causes the structure to settle or tip. Loss of bearing strength can also cause light buildings with basements, buried tanks, and foundation piles to rise buoyantly through the liquefied soil.

Large ground motions resulting from liquefaction, especially lateral spreading, can cause damage to buried pipelines. Most pipe breaks during the Loma Prieta earthquake were in areas with significant thickness of liquefiable soil (greater than 3 feet). Broken pipelines represent a serious public safety issue as demonstrated by burning natural gas lines in the 1994 Northridge earthquake and broken water mains in San Francisco in the 1906 earthquake.

Ground shaking levels that are strong enough to cause liquefaction are present in all of the alluvial basins in Monterey County. Liquefaction potential is shown in Exhibit 4.4.3. Areas in Monterey County most susceptible to liquefaction include the Salinas River and floodplain, the Moss Landing and Elkhorn Slough areas, the Carmel River and floodplain, the San Antonio and Lockwood Valleys, and the Peachtree and Cholame Valleys.

Slope Instability and Landslides

Landslides are common in Monterey County due to the combination of the rapidly uplifting mountains, locally fractured and weak rocks, and sometimes intense rainfall along the coast. Many ancient landslides formed during the Pliocene or Pleistocene, between 11,000 and 2 million years before the present. Younger landslides formed during the Holocene, or past 11,000 years, are commonly divided into recent or historic deposits and old landslides. Very young landslides have fresh scarps, disrupted drainages, closed depressions, and disturbed vegetation. Older landslides are modified by erosion, resulting in subdued scarps, reestablished vegetation, and new drainage paths. Soils have formed on some older landslide deposits; however, most soils are poorly developed or absent because of high erosion rates and steep slopes.

Causes of Landslides

There are many causes for landslides, but for geologic hazard evaluation, they can be divided into two main groups: human activity and natural causes. Humans can cause landslides by improperly designing or constructing roads, buildings, and septic systems; excavating the toe of a slope or loading the upper slope; vegetation removal; mining; and human-introduced water sources (lawn watering, leach fields, storm drains, and water lines). Natural causes include steep slopes, weak rock, unfavorably inclined planes of weakness (bedding, joints, and faults), undercutting by streams and waves, intense rainfall, vegetation removal by fire, and earthquakes.

Regardless of whether they are caused by human or by nature, all landslides share some common causes. The first is that slopes become unstable as a result of a decrease in the resisting forces that hold the earth mass in place or an increase in the driving forces that facilitate its movement. The second is that water is a key factor in nearly all landslides because it increases the weight of the soil, thereby increasing the driving forces. Water also acts as a lubricant and serves to decrease the resisting forces. An understanding of water and its effect on slope equilibrium is essential to mitigating landslide hazards.

Most landslides are generated by intense rainfall. Other initiating causes include fires and earthquakes. The temporal pattern of high-intensity, short-duration rainfall is a more important factor in triggering landslides than annual or monthly precipitation totals. Antecedent moisture conditions determine whether large amounts of rainfall will successfully trigger a landslide. If earth materials already contain significant moisture from prior rainfall, the severity of precipitation from a new storm can be less yet can still trigger a landslide. If

other factors are equal, magnitude, intensity, and duration of the storm are important factors that can contribute to hillslope instability.

Landslides are one of the most costly geologic hazards to affect the County and are responsible for millions of dollars in damage to houses and roads. As population growth increases, there is increased development pressure to build on unstable slopes. Proper planning can significantly reduce the risks associated with landslides.

Types of Landslides

Landslides and other forms of slope failure form in response to the long-term geologic cycle of uplift, mass wasting, and disturbance of slopes. Mass wasting refers to a variety of erosional processes from gradual downhill soil creep to mudslides, debris flows, landslides, and rock fall—processes that are commonly triggered by intense precipitation that varies according to climactic shifts. Often various forms of mass wasting are grouped together as "landslides," the term generally used to describe the downhill movement of rock and soil.

Geologists classify landslides into several different types that reflect differences in the type of material and type of movement. The four most common types of landslides are translational, rotational, earth flow, and rock fall. Debris flows are another common type of landslide that is similar to earth flows, except that the soil and rock particles are coarser. "Mudslide" is a term that appears in non-technical literature to describe a variety of shallow, rapidly moving earth flows. All of these types of landslides are abundant in Monterey County.

Deep-seated rotational and translational slides are common in several types of geologic units, especially in the Franciscan Complex rocks. The Franciscan rocks and associated serpentinite are relatively unstable because of their numerous discontinuities (faults, joints, and shear zones) and tend to fail as multiple, nested landslides. Granitic and metamorphic basement rocks also have rotational slides, although to a lesser degree than the Franciscan rocks. Debris flows may be more common. Coastal terrace deposits are susceptible to shallow-seated rotational slides.

Landslides occur in all the geologic units, but translational slides are most common in the Monterey Formation. The Monterey Formation is especially prone to translational slides along clay beds. Good examples of translational landslides in the Monterey Formation are along Carmel Valley Road near Arroyo Seco, where the beds are inclined in the same direction as the slope and are sliding in what geologists refer to as "dip-slope conditions." Under these conditions, slip can occur between the beds. This is most common in clay or shale beds where moisture between the beds can cause expansion of highly plastic clays, such as smectite, and form a zone of weakness where downslope shear stress can exceed the strength of the material and trigger a landslide.

Rock falls along road cuts and steep slopes are widespread in the igneous, metamorphic, and volcanic rocks, especially on high ridges and peaks. Many rock falls are a result of failure along closely spaced intersecting discontinuities,

especially where undercut by roads or streams. Localized areas of rock fall are present throughout the Arroyo Seco watershed. Rocks deposited on hillslopes are subject to rolling or sliding where fire has removed the groundcover that stabilized them. Rock falls typically occur shortly after periods of intense rainfall and during earthquakes. The risk of earthquake-triggered landslides in the County that was tabulated from various geological data mostly provided by the USGS and CGS is included as Exhibit 4.4.4.

Relative susceptibility to landslides can be described according to the following geologic conditions:

- **Low**: Flatlands and low relief terrain, includes mainly Quaternary deposits. In steep terrain, includes mainly crystalline basement rock, volcanic rock, and Cretaceous sandstone. Approximately 5% of the area is likely to fail in a major earthquake.
- **Moderate**: Moderately steep terrain underlain by mainly unconsolidated and weakly cemented sandstone, shale, and Franciscan Complex. Approximately 15% of the area is likely to fail in a major earthquake.
- **High**: Steep terrain underlain by mainly unconsolidated and weakly cemented sandstone, shale, Franciscan Complex, and existing landslides. Approximately 25% of the area is likely to fail in a major earthquake.

Land Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface owing to subsurface movement of earth materials. The principal causes of land subsidence in the region are groundwater mining, which can cause collapse of aquifer sediments and compaction, drainage of organic soils, underground mining, hydrocompaction, and sinkholes. There is little documentation of widespread subsidence in Monterey County.

Aquifer-system compaction (groundwater mining) results from pumping ground water out of the aquifer faster than it is able to recover through recharge. This has caused considerable subsidence—as much as 15 to 25 feet in parts of the Santa Clara and San Joaquin Valleys. It is less common in the Salinas Valley, perhaps due to relatively less diversion of the Salinas River and lower evapotranspiration rates, particularly near the coastal margin. Subsidence can also result from pumping oil and gas, although this is less common than pumping of groundwater. No significant subsidence was reported for the San Ardo oil field or any other oil fields in the County.

There is little evidence of widespread land subsidence from drainage of organic soils, underground mining, or hydrocompaction in Monterey County. Another form of local subsidence is from sinkholes. These most commonly form when the roof of an underground tunnel or cavity collapses. Sometimes when a water main bursts, the ground above will collapse since the subsurface fill was washed out. Sinkholes also occur where rapid runoff erodes subsurface strata above rock

or another hard layer and eventually causes the surface soils to collapse. This process is sometimes related to gullying of erosive surface soils or very soft rock.

4.4.2.4 Soil Hazards

Soil hazards can be considered a subset of geologic hazards that, due to their complexity, are often considered separately. Soils are directly impacted by land use change and climate patterns since they lie at the surface, where development impacts are concentrated. They are therefore a primary consideration of any geotechnical investigation or soils report for a development. Soil characteristics directly impact land use. Soil ideal for agriculture may not be suitable for building foundations or roadways, while certain erosive or expansive soils are entirely unsuitable to use as engineered fill. Important soil characteristics include the properties related to agricultural and natural habitat resources, as well as those properties related to land development projects. Once site-specific soil properties are known, potential impacts on particular land use projects should be evaluated and necessary mitigations implemented. Improper design for specific soil conditions can cause significant financial losses and can influence the performance and safety of civil works. Similarly, soils often have important agricultural or habitat properties that should be considered in planning decisions. To put the importance of soil characterization in perspective, the State of California has estimated that statewide losses[1] caused by damage from expansive soils from 1970 through 2000 exceeded $150 million and losses from erosion during the same period totaled $565 million.

The complexity of the County's geology is reflected in the 25 major soil associations found in the County. These associations represent hundreds of soil series, which were mapped and analyzed in great detail by the U.S. Department of Agriculture Soil Conservation Service in 1978. The variety of soils is due to the variability of the five major soil-forming factors within the County. These are parent material, climate, topography, biological factors, and time. Coastal soils that formed upon the same parent materials as interior soils may vary widely due to the contrast between the cool and damp maritime climate versus the hot and dry climate of the interior. Common soils associations include the Cieneba-Sur-Junipero (CSJ), Sheridan-McCoy, Santa Lucia Reliz (SLR), Oceano, Garey-Greenfield (OGG), Arnold-Santa Ynez, Shedd (ASS)-Los Osos-Nacimiento (LN) and Lithic Xerothents-Gaviota-Plaskett (LXGP).

The Natural Resources Conservation Service has interpreted the behavior of the soils they mapped under various circumstances and examined their suitability for particular land uses. The soil interpretations most useful for planning and land use decisions are runoff potential; erosion hazard; shrinking and swelling behavior; and suitability for agriculture, shallow excavations, sanitary landfills, septic tank absorption fields, roads and streets, dwellings and small commercial buildings. Soil interpretations for farmlands have particular importance in Monterey County, which contains over 300,000 acres of productive farmlands.

[1] The estimate assumes that agricultural and engineering practices are consistent through the 30-year period.

The classifications used for the farmlands inventory, in order of decreasing productivity, are Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. Prime Farmlands occur in scattered acreages throughout the County, but the most extensive acreages occur on the deep, rich soils of the Salinas Valley, sometimes referred to as the "nation's salad bowl." Soil, climate, and a third component—water—combine to help make Monterey County one of the most agriculturally productive areas in the world. Monterey County does not have any designated Farmland of Local Importance.

Erosion

Erosion can be defined as the wearing away of the land surface by flowing water, waves, or wind, or by such process as mass wasting and corrosion. Erosion not only leads to soil loss but also results in degraded water quality, unwanted soil deposition leading to property damage, and increased danger from flooding. In Monterey County, erosion is a significant force that affects three distinct types of land use: agricultural land, residential development, and coastal bluffs.

Soils can sometimes be quantitatively rated as to their erosion hazard potential. The relative erosion hazard is depicted at a County-wide scale in Exhibit 4.4.5.

Agricultural Erosion

Soil loss or soil erosion is most common in the North County, especially where strawberries are grown on moderately steep hillsides in the Aromas Sand Formation. Loamy sand soils developed on top of sandy dunes or slopes are highly erosive; moderately steep slopes greater than 15% that would not normally be considered erosive if underlain by more cohesive soil or rock are particularly susceptible to scour from wind or from being washed away through runoff, especially when bare. In the Salinas Valley, erosion and deposition are directly related through flooding, where sediment is picked up in one area, transported, and deposited in another. This includes sediment eroded from stream banks due to scouring flow. There is also general erosion on terrace surfaces and wind erosion of bare soils, especially those with low cohesion that have formed from sandy deposits. Due to grading and terracing on unstable slopes, erosion is sometimes triggered on even moderately steep slopes, especially in unvegetated or unplanted areas. Outside the Salinas Valley, there are wide-open undeveloped areas such as in the South County and Diablo Range. In these areas, a substantial proportion of soil erosion may be attributed to livestock grazing, where soil that is bare from compaction and trampling may concentrate runoff and lead to rilling or gullying of the ground. This problem often can be controlled through careful management of rangeland and avoidance of overgrazing. It is also important to consider the benefits of grazing, such as the reduction of overgrown vegetation that raises the fire hazard.

Hillside Development Erosion

Erosion is commonly concentrated on steep slopes; therefore, soil disturbance or grading on steep slopes is likely to trigger erosion unless controlled. Common

causes of erosion are (1) site grading and disturbance of soil and rock during construction, where runoff and improper drainage can trigger erosion and improper drainage; and (2) post-construction drainage. Problems during construction include gullying across freshly graded slopes that have not been seeded or mulched for the winter, slumping of loose soils, and soils or rock fall over steeply cut banks. Poorly graded roads also may allow water to concentrate, resulting in erosion and deposition; in extreme cases, ruts can channel water, creating washouts that can trigger minor debris flows or landslides. Post-construction erosion is mainly a result of poorly designed and maintained drainage structures such as culverts, pipe down-drains, and ditches. Concentrated runoff may erode soil simply by the large impact force that can be generated from high-velocity flows, while sediment-laden water from turbid runoff often can cause drainageways to become clogged and may trigger further erosion by redirecting flow into areas unable to handle the concentrated runoff.

Coastal Erosion

Coastal erosion of dunes, cliffs, and bluffs is a serious problem in Monterey County. Coastal erosion of cliffs is concentrated along the Big Sur Coast due to very steep terrain; but there are locally severe erosion problems in the south Monterey Bay area, mainly due to highly erosive windblown sand and particularly in the incorporated and unincorporated areas around Marina, Sand City, Monterey, and Fort Ord. In this area, the coastline is one of low relief, with sand dunes present from the Pajaro River southward to Carmel, and much erosion is due to movement of unstable windblown sand—especially where vegetation has not been established. Much beachfront property is also lost from high surf and wave action that is concentrated during winter storms. This sand may be redistributed along the coast in a process known as long-shore or littoral drift. When sand is depleted or cut off by an obstruction, the result is often severe; with no new sand to reform the beach, a major retreat of the coastline occurs. This problem is forecast to get worse based on some projections of global warming causing the sea level to rise.

In the Marina State Beach area, bluffs and dunes retreated at an average rate of 5 to 7 feet per year from 1937 to 1983. For example, Stilwell Hall at the former Fort Ord Officer's Club was originally built 300 feet from the beachfront in 1943, but by 2000 was already being threatened by beach waves and has since been demolished. The sewer outfall at Fort Ord also experienced major erosion since construction in 1962, where the beach retreated 175 feet in 21 years. As much as 40 feet of retreat occurred during the storms of 1982 and 1983 when there was an El Niño climatic pattern. Major retreat of the beach has also occurred in the Sand City area, where the beach has retreated 6 to 8 feet per year on average between 1956 and 1975. Some of this is due to sand mining operations.

South of Carmel, the coastline steepens and bluffs are the dominant landform due to the high rates of tectonic uplift. In contrast to the uniformly high erosion rates of the sand dunes along southern Monterey Bay, the erosion rates on the Big Sur Coast differ depending on the type of bedrock, degree of fracturing and weathering, ground water seepage, and exposure to waves. Generally, the

granitic and metamorphic rocks are relatively resistant to erosion, except near faults and other areas of intense fracturing and weathering. Some rocks of the Franciscan complex are intrinsically weak and more readily eroded compared to granitic and metamorphic rocks. In addition, several landslides along State Highway 1 are caused by erosion from violent wave action.

The least resistant units to erosion are the coastal terrace deposits. The terrace deposits are typically far enough above sea level that they are not subject to direct wave action. However, they are subject to erosion from surface water and seepage. Because of their relatively porous texture, large quantities of water can infiltrate into terrace deposits. Groundwater is a major influence in cliff erosion. Erosion takes place through a process known as "spring sapping," in which bluffs are undermined by flowing water loosening rock particles and chemically dissolving the cement that binds the particles. A similar process is "piping," in which water flows through open channels such as burrows, eroding and enlarging them. Non-natural sources of water such as irrigation, septic effluent, and urban runoff add significant amounts of water that could contribute to sapping and piping. Lawn and garden watering contributes the equivalent of 70 to 80 inches per year of rain and 500 to 800 gallons per day of septic effluent. Under certain hydrogeologic conditions, some of this water could contribute to erosion in the form of mass wasting (or even landslides) by groundwater.

Other influences on coastal erosion include changes in climate. Both short-term events such as El Niño storm cycles and long-term events such as rising sea level will increase erosion rates along the coast. Therefore, structures sited along the coast must account for these extreme events.

Unstable Geologic Units

Unstable geologic units are those that lack the integrity to support human-made improvements such as buildings and roadways. This may be due to lack of strength, lack of compaction or low density, or unsuitability of material for a particular foundation. Unstable geologic units may also be initially stable and lose stability due to improper drainage or buildup of pore pressure that causes a reduction in strength. Major problems include settlement, lurch cracking, differential settlement, and expansion. Instability is often due to a range of factors that may be difficult to quantify but can be collectively attributed to unstable native materials and unstable fill soils. Unstable geologic units include soft marshy soils that are prone to subsidence, sandy soils with shallow groundwater prone to liquefaction, and friable or poorly indurated rock such as the Monterey Formation or alluvium that can fail on slopes. Particularly unstable are fill soils or debris placed over marshes and wetlands to create new land. This includes a variety of heterogeneous mixtures of loose to very well consolidated gravel, sand, silt, clay, rock fragments, organic matter, and human-made debris.

Expansive Soils

Expansive soils shrink and swell depending on moisture level as the clay minerals in these soils expand and contract. Soils with moderate or high expansion potential are susceptible to shrinking and swelling due to fluctuations in moisture content and are a common cause of foundation deterioration, pavement damage, cracking of concrete slabs, and shifting of underground utilities. According to the California Building Code, soils with an expansion index exceeding 91 are considered highly expansive; such soils would typically have a liquid limit of 40 or more and plasticity index exceeding 15. These soils are undesirable for use as engineered fill or subgrade directly underneath foundations or pavement, and must be replaced with non-expansive engineered fill or require treatment to mitigate their expansion potential.

4.4.2.5 Other Hazards

Tsunami

Tsunamis are ocean waves caused by large earthquakes and landslides that occur near or under the ocean. When tsunamis approach shore, they behave like a very fast-moving tide that extends far inland. Powerful tsunamis, such as the one that struck Southeast Asia in December 2004, can level structures and result in significant loss of human life. Tsunami waves can persist for many hours because of complex interactions with the coast. The most recent tsunami to strike California occurred in Crescent City in 1964. Currently, efforts are underway to map tsunami inundation zones along the California coast.

Seiche

Seiches are standing waves set up on rivers, reservoirs, ponds, and lakes when seismic waves from an earthquake pass through the area. Effects of seiches are similar to those of a tsunami.

Mudflow

A mudflow (used interchangeably with “debris flow” or “lahar”) is a flowing mixture of water-saturated debris that moves downslope under the force of gravity. Mudflows consist of material varying in size from clay to blocks several tens of meters in maximum dimension. When moving, they resemble masses of wet concrete and tend to flow downslope along channels or stream valleys. Mudflows are formed when loose masses of unconsolidated wet debris become unstable.

The major hazard to human life from mudflows is from burial or impact by boulders and other debris. Buildings and other property in the path of a mudflow

can be buried, smashed, or carried away. Because of their relatively high density and viscosity, mudflows can move and even carry away vehicles and other objects as large as bridges.

4.4.3 Regulatory Framework

4.4.3.1 Federal Regulations

Uniform Building Code

The Uniform Building Code (UBC) defines different regions of the United States and ranks them according to their seismic potential. There are four types of these regions—Seismic Zones 1 through 4, with Zone 1 having the least seismic potential and Zone 4 having the highest. Monterey County is located in Seismic Zone 4; accordingly, any future development would be required to comply with all design standards applicable to Seismic Zone 4.

Disaster Mitigation Act of 2000

The Federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) emphasizes the need for state, tribal, and local entities to closely coordinate disaster mitigation planning and implementation efforts.

Section 322 of the DMA requires adoption of a state mitigation plan as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the state level through the establishment of requirements for two different levels of state plans: standard and enhanced. States that demonstrate an increased commitment to comprehensive mitigation planning and implementation through development of an approved Enhanced State Plan can increase the amount of funding available through the Hazard Mitigation Grant Program (HMGP). Section 322 also establishes a new requirement for local mitigation plans and authorizes up to 7% of HMGP funds available to a state to be used for development of state, tribal, and local mitigation plans.

Provisions of the DMA 2000 include:

- funding for disaster planning and mitigation;
- development of experimental multi-hazard maps to better understand risk;
- establishment of state and local government infrastructure mitigation planning requirements (Advance Infrastructure Mitigation [AIM]);
- defining how states can assume more responsibility in managing the HMGP;
- adjusting ways in which management costs for projects are funded; and

- establishment of performance-based standards for mitigation plans and requiring states to have a program (AIM) to develop County government plans. Should counties fail to develop an infrastructure mitigation plan, their federal share of damage assistance would be reduced from 75 to 25% if there was recurrent damage to the same facility or structure in response to the same type of disaster.

To maintain compliance with DMA 2000 and receive full federal funding, Monterey County and its cities prepared the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) that was adopted in September 2007 by those jurisdictions. This detailed plan identifies potential natural and man-made hazards, assesses their likely risk, and includes mitigation methods to reduce risks. The potential hazards identified in the MJHMP include coastal erosion, dam failure, earthquake, flood, hazardous materials event, landslide, tsunami, wildland fire, and windstorm. Mitigation measures proposed to address these risks Countyincluded preventative actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities.

4.4.3.2 State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

The primary purpose of the A-P Act is to mitigate the hazard of fault rupture by prohibiting the location of structures for human occupancy across the trace of an active fault. The A-P Act addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards.

The A-P Act requires the State Geologist (Chief of the California Geologic Survey) to delineate EFZs along faults that are sufficiently active and well defined. "Sufficiently active faults" show evidence of Holocene surface displacement along one or more or their segments. "Well-defined faults" are clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The boundary of an EFZ is generally about 500 feet from major active faults, and 200 to 300 feet from well-defined minor faults. The A-P Act dictates that cities and counties withhold development permits for sites within an Alquist-Priolo (A-P) Zone, until geologic investigations demonstrate that the sites are not threatened by surface displacements from future faulting.

A-P Zone mapping has been completed by the State Geologist for all of the quadrangles in Monterey County. The maps have been distributed to all affected cities, counties, and state agencies for their use in developing planning policies and controlling renovation or new construction. Local agencies must regulate most development projects within the A-P Zones. Projects include all land divisions and some structures constructed for human occupancy. While state law exempts single-family wood-frame dwellings and steel-frame dwellings that are less than three stories and are not part of a development of four units or more, local regulations may be more restrictive than state law.

Before a project can be permitted within an identified EFZ, cities and counties require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults. This requires that a site-specific evaluation and written report prepared by a state-licensed geologist document the occurrence or absence of an active fault. This commonly requires trenching to identify any offset strata but also may be completed through simple observation of surface fault expression. If an active fault is identified, a structure intended for human occupancy cannot be placed over the trace of the fault and must be set back, generally no closer than 50 feet from the fault.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (SHMA) addresses non-surface fault rupture earthquake hazards, including strong ground shaking, liquefaction, and seismically induced landslides. The CGS is the principal state agency charged with implementing the SHMA. Pursuant to the SHMA, the CGS is directed to provide local governments with seismic hazard zone maps that identify areas susceptible to amplified shaking, liquefaction, earthquake-induced landslides, and other ground failures. The goal is to minimize loss of life and property by identifying and mitigating seismic hazards. The seismic hazard zones delineated by the CGS are referred to as "zones of required investigation." Site-specific geotechnical hazard investigations are required by SHMA when construction projects fall within these areas. Seismic hazard maps covering Monterey County for both liquefaction risk and earthquake-induced landslides are presented as Exhibits 4.4.3 and 4.4.4.

California Building Standards Code

Title 24 of the California Code of Regulations, also known as the California Building Standards Code, sets forth minimum requirements for building design and construction. The California Building Standards Code is a compilation of three types of building standards from three different origins:

a) Building standards that have been adopted by state agencies without change from building standards contained in national model codes;

b) Building standards that have been adopted and adapted from the national model code standards to meet California conditions; and

c) Building standards, authorized by the California legislature, constituting extensive additions not covered by the model codes that have been adopted to address particular California concerns.

In the context of earthquake hazards, the California Building Standards Code design standards have a primary objective of ensuring public safety and a secondary goal of minimizing property damage and maintaining function during and following seismic event. Recognizing that the risk of severe seismic ground motion varies from place to place, the California Building Standards Code

seismic code provisions vary depending on location (Seismic Zones 0, 1, 2, 3, and 4—with 0 being the least stringent and 4 being the most stringent). Monterey County is located in Seismic Zone 4.

California Department of Transportation Seismic Safety Retrofit Program

The California Department of Transportation (Caltrans) Seismic Safety Retrofit Program was established by emergency legislation (SB 36X) after the October 17, 1989, Loma Prieta earthquake. The purpose of this program is to evaluate all publicly owned bridges in California and to take actions necessary to prevent their collapse due to earthquakes. The local component of the Seismic Safety Retrofit Program provides funding and other assistance to cities and counties for evaluating bridges and improving their resistance to seismic shaking.

4.4.3.3 Local Regulations

Monterey County Grading and Erosion Control Ordinances

Chapters 16.08 and 16.20 of the Monterey County Code regulate grading and erosion control, respectively. These ordinances supplement the regulations from the California Building Standards Code, which addresses standards for all grading construction. These ordinances help to maintain safe grading conditions and erosion control in order to avoid potentially harmful impacts related to property, the public, and environmental health. Slope failure or bank collapses due to improper grading and erosion of sediment into waterways are two critical hazards.

Monterey County Grading Ordinance

The County grading ordinance generally regulates grading involving more than 100 cubic yards of excavation and filling. Minor fills and excavations (cuts) of less than 100 yards that are not intended to provide foundation for structures, or that are very shallow and nearly flat, are typically exempt from the ordinance, as are shallow footings for small structures. Submittal requirements for a County grading permit include site plans, existing and proposed contour changes, an estimate of the volume of earth to be moved, and geotechnical (soils) reports. Projects involving grading activities over 5,000 cubic yards must include detailed plans signed by a state-licensed civil engineer.

Grading is not allowed to obstruct storm drainage or cause siltation of a waterway. All grading requires that temporary and permanent erosion control measures be implemented. Grading within 50 feet of a watercourse, or within 200 feet of a river, is regulated in the Zoning Code Floodplain regulations. Work in the Salinas River and Arroyo Seco River channels is exempted if it is covered by a U.S. Army Corps of Engineers 5-year regional 404 permit, approved by the

California Department of Fish and Game, and approved by the Monterey County Water Resources Agency.

In addition to grading ordinance provisions, the Zoning Code (Chapter 1.64.230) details specific regulations for development on slopes in excess of 30%, including conformance with the grading ordinance and erosion control requirements. Specific geotechnical or engineering geologic investigation requirements include the following:

1) Presentation of data regarding the nature, distribution, and strength of existing soils.
2) Recommended grading procedures and design criteria for corrective measures when necessary, including buttress fills.
3) Examination and recommendations to maintain slope stability.
4) Description of the site geology of the site and the effect of geologic conditions on the proposed development.
5) Incorporation of approved report recommendations in the grading plans and specifications. (Ord. 2535 110, 1979.).
6) Completion of a liquefaction study, where applicable and the potential for liquefaction, should there be:
    a) Shallow ground water at 50 feet (15.24 meters) or less,
    b) Unconsolidated sandy alluvium,
    c) Site within Seismic Zone 4.

Design standards in the ordinance include requirements for fill slopes, cut slopes, and drainage controls.

Monterey County Erosion Control Ordinance

The County Erosion Control Ordinance generally prohibits development on slopes greater than 30%, requiring completion of an Erosion Control Plan, control of runoff, avoiding creek disturbance, regulating land clearing, and prohibiting grading activities during the winter. Enforcement of the Erosion Control Ordinance is by the County Director of Building Inspection.

Monterey County Local Coastal Program

The California Coastal Act requires all development within the coastal zone to comply with policies and regulations enacted by the state and the California Coastal Commission (CCC) for the protection of the coast and its resources. Under the Coastal Act, the CCC delegates land use regulation to cities and counties for which a Local Coastal Program (LCP) has been certified. Regulation within the coastal zone is covered under Title 20 of the Monterey County Code, which embodies the Commission-certified Monterey County LCP. Coastal regulations are established by several local coastal land use plans under the LCP.

To carry out the Coastal Act policies relating to coastal hazards, the Monterey County LCP has provisions to address shoreline hazards, steep slopes and unstable areas, wildland fire, and coastal flooding. The LCP identifies high hazard areas specific to each coastal planning area. Monterey County's LCP consists of four planning areas: North County–Coastal, Del Monte Forest, Carmel Area, and Big Sur Coast.

The *North County Land Use Plan* identifies seismic and geologic high hazard areas as:

a) zones ⅛-mile wide on each side of active or potentially active faults;

b) areas of Tsunami Hazard;

c) areas indicated as "Underlain by Recent Alluvium" and "Relatively Unstable Upland Areas" in the County Seismic Safety Element;

d) Geotechnical Evaluation Zones IV, V, and VI on the County Seismic Safety Element maps;

e) Geotechnical Evaluation Zones V and VI on the Monterey Peninsula Map of the County; and

f) the 100-Year Floodplain and areas classified as having a high to extreme fire hazard through application of the California Department of Forestry and Fire Protection criteria.

The Carmel Area Land Use Plan reflects this list except that it also includes existing landslides and adds consideration of the Fire Hazard Severity Scale in determining fire hazards. The Del Monte Forest Land Use Plan identifies high hazard areas related to seismic and fire risk. Slopes over 30% in combination with unstable bedrock or soils are noted as potentially hazardous, and the Cypress Point fault (potentially active) and minor faulting in the Pescadero Canyon area are the most significant local hazards. Most forested areas of the Del Monte Forest are considered high fire hazard areas. While not specifically identified as a high flood hazard area, the Del Monte Forest Land Use Plan policies address areas subject to potential wave run-up and prohibition of development on bluff faces. The Big Sur Coast Land Use Plan notes that the entire area presents a high degree of hazards, including seismic, geologic, flood, and fire hazards.

Monterey County Health and Safety Element

California Planning Law (Government Code Section 65300 et seq.) requires the County to adopt a Safety Element as an integral part of its General Plan. Safety elements address evacuation routes, traffic congestion, and peak occupant and traffic loads for structures; water supply requirements; and minimum road widths and clearance around structures—as those items relate to identified fire and geologic hazards. The intent of the state-mandated Safety Element is to ensure that local governments develop the regulatory tools necessary to protect public health, safety, and welfare against disasters and hazards.

The Safety Element is expected to establish objectives and policies that will protect the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, dam failure, slope instability leading to mudslides and landslides, subsidence, liquefaction, and other seismic and geologic hazards; flooding; and wildland and urban fires.

The current Monterey County Health and Safety Element was updated in 2004 and again in 2006. This element incorporates two of the seven state-mandated General Plan elements—the Safety Element and the Noise Element. The Safety Element is included in the 2007 General Plan update and incorporates the state requirements for contents of both the safety and noise elements.

4.4.4 Project Impacts

4.4.4.1 Methodology

Widely available industry sources were examined to document regional and local geology. Information regarding regional geology and seismically induced hazards was taken from various sources of the California Department of Conservation, California Geological Survey (CDC, CGS). Information about soil characteristics was derived from the Soil Conservation Service's Soil Survey of Monterey County. In addition, information related to other seismic hazards, such as landslide and liquefaction zoning, was taken from CDC, CGS maps as well as the existing 2006 Monterey County General Plan and General Plan EIR. Where potential geological hazards are identified for a particular planning area within Monterey County, such hazards are expected to affect any potential development in that planning area.

4.4.4.2 Thresholds of Significance

Implementation of the 2007 General Plan would result in a potentially significant impact relative to geology, soils, and seismicity if it would:

a) expose persons or structures to geologic hazards such as fault rupture, ground shaking, liquefaction, or landslides;

b) result in substantial soil erosion or loss of topsoil;

c) permit development on unstable geologic units or soils;

d) permit development on expansive soils;

e) permit the use of septic or alternative wastewater systems in areas where soils are incapable of supporting such systems; or

f) expose persons or structures to inundation by tsunami, seiche, or mudflow.

4.4.4.3 Impact Analysis

Buildout of the 2007 General Plan to the 2030 and 2092 planning horizons could result in impacts related to the following geologic hazards: fault rupture, ground shaking, liquefaction, landslides, erosion, expansive soils, septic tanks, and tsunami/seiche/mudflow. Adverse impacts on geology, soils, and seismicity associated with implementation of the 2007 General Plan are detailed in this section in the discussions for Impacts GEO-1 through GEO-8. Buildout of the General Plan through 2092 would involve development of all available lots now known (41,000 plus units) based on the dwellings per year from the 2030 AMBAG growth estimate. As geologic impacts are location-oriented and buildout to 2092 proposes growth for the same locations as under the 2030 planning horizon, buildout to 2092 would potentially result in similar adverse impacts on geology, soils, and seismicity as those described in this section for 2030 planning horizon impacts. The 2007 General Plan and Area Plans policies set forth comprehensive measures to avoid and minimize adverse impacts related to geology, soils, and seismicity, to the maximum extent practicable. The 2007 General Plan and Area Plans policies summarized below in this section identify seismically sensitive areas and mitigation measures to reduce impacts related to potential impacts. It is anticipated that building codes, grading ordinances, and seismic measures to reduce the potential for geologic hazards would evolve and become more effective over time.

It should also be noted that one of the expected effects of global climate change is rising sea levels. This would expand inland the coastal areas potentially affected by tsunami. Climate change impacts are addressed in the Climate Change section of this EIR.

Fault Rupture

Impact GEO-1: Implementation of the 2007 General Plan could expose persons and property to fault rupture hazards. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan to the 2030 planning horizon would result in new urban and agricultural development in undeveloped areas. As a result, more persons and structures could be exposed to geological hazards such as fault rupture. Fault rupture as a result of seismic shaking would be harmful because it could cause structural failure and collapse of poorly built structures and cause nonstructural building elements to fall. This could result in utility lines (electrical and natural gas) breaking presenting a hazard to occupants and nearby persons, and damage to contents.

Faults considered recently active by the CGS are the San Andreas and Palo Colorado-San Gregorio Fault systems. Since the Palo Colorado-San Gregorio Fault is mapped underneath the Monterey Bay, only the San Andreas Fault has mapped active traces onshore at risk for fault rupture. These fault traces are included in A-P Zones. However, the 2007 General Plan would not result in more persons and structures proximate to the San Andreas fault or its respective A-P Earthquake Fault Zones (refer to Exhibit 4.4.1). Finally, unexpected ground rupture from a previously unmapped active fault is possible but unlikely, due to the considerable mapping and fault research completed throughout the County.

2007 General Plan Policies

The 2007 General Plan and Area Plan policies summarized below set forth comprehensive measures to minimize adverse fault rupture impacts.

Safety Element

Safety Element Policies S-1.1, S-1.2, S-1.4, S-1.5, and S-1.8 (consider fault rupture hazards, restrict development in mapped hazard areas, and enforce the A-P Act) direct future growth away from areas of potential fault rupture such as A-P Earthquake Fault Zones for the purpose of avoiding or minimizing geologic hazards. Policies S-1.3, S-1.6, and S-1.7 (establish conditions/standards for geotechnical studies) would help to avoid fault rupture hazard exposure risks in future development by implementing geotechnical study recommendations.

Area Plan Policies

There are no additional Area Plan policies related to fault rupture hazards.

Master Plan Policies

Fort Ord Master Plan

Supplemental policies in the Fort Ord Master Plan address fault rupture hazards. Seismic and Geologic Hazards Policies A-1 and A-2 (Countydevelop standards for minimizing seismic risk and use development review process) would help to avoid fault rupture hazard exposure risks with future development by implementing standards and geotechnical study recommendations. Seismic and Geologic Hazards Policy A-3 (Countyidentify areas of high seismic risk) would help to avoid fault rupture hazard by restricting new development in such high seismic risk areas.

Significance Determination

Implementation of the 2007 General Plan within the 2030 planning horizon could potentially result in adverse impacts related to fault rupture. However, the 2007 General Plan would not result in more persons and structures proximate to the San Andreas fault or its respective A-P Earthquake Fault Zones, and much of the proposed development within the planning areas near other County faults would be agricultural (wine-industry-related). Risks to agricultural development from ground rupture are minimal compared to risks to denser urban development. Most notably, structures (e.g., winery structures containing wine barrels) would not be permitted within 50 feet of an active fault. In addition to not locating structures or development across a known or suspected active fault trace, a primary mitigation for reducing risk would be requiring that new construction in Monterey County comply with California Building Code (CBC) Zone 4 seismic building criteria standards. These standards are designed to reduce ground rupture risks to acceptable levels, and contain construction requirements to minimize potential loss of life during an earthquake. Development in accordance with the 2007 General Plan, adherence to the A-P Act, and enforcement of the CBC would ensure that impacts related to potential fault rupture would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies and Area Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies and respective Area Plan policies as well as adherence to CBC standards would reduce impacts related to potential fault rupture to a less-than-significant level.

Buildout

Impact of Development with Policies

Buildout under the 2007 General Plan to 2092 would result in new urban and agricultural development in undeveloped areas beyond 2030 levels. New development could expose more persons and structures to geological hazards such as fault rupture.

2007 General Plan Policies

The 2007 General Plan and Area Plan policies summarized above identify high seismic risk areas and place restrictions on future development in those areas to minimize adverse fault rupture impacts.

Significance Determination

Buildout under the 2007 General Plan to 2092 could potentially result in adverse impacts related to fault rupture. However, the 2007 General Plan would not result in more persons and structures proximate to the San Andreas fault or its respective Alquist-Priolo Earthquake Fault Zones. Nonetheless, new structures would not be permitted within 50 feet of an active fault, and new construction throughout the County would comply with CBC Zone 4 seismic building criteria standards that are designed to reduce ground rupture risks to acceptable levels. Development in accordance with the 2007 General Plan, adherence to the Alquist-Priolo Act, and enforcement of the CBC would ensure that impacts related to potential fault rupture would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies and Area Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies and respective Area Plan policies as well as adherence to the Alquist-Priolo Act and CBC standards would reduce impacts related to potential fault rupture to a less-than-significant level.

Ground Shaking

Impact GEO-2: Land uses and development consistent with the 2007 General Plan could expose people or structures to substantial adverse seismic effects, including the risk of loss, injury, or death involving strong seismic ground shaking. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan within the 2030 planning horizon would result in new urban and agricultural development in undeveloped areas. As a result, more persons and structures would be exposed to geological hazards such as ground shaking. Strong seismic ground shaking can be harmful, because it could cause structural failure and collapse of poorly built structures and could cause nonstructural building elements to fall, presenting a hazard to occupants and damage to contents.

Specifically, the 2007 General Plan would result in more persons and structures in and near areas of high probability for strong ground shaking in Pajaro and areas of high probability for moderate ground shaking throughout

the Salinas Valley stretching from Castroville to Bradley (refer to Exhibit 4.4.2). While strong ground shaking is *probable* in these areas, it is *possible* throughout the County from several seismic sources.

2007 General Plan Policies

The 2007 General Plan policies summarized below establish comprehensive measures to minimize adverse ground shaking impacts.

Safety Element

Safety Element Policies S-1.1, S-1.2, S-1.5, and S-1.8 (restrict siting of land uses in identified hazard areas and limit approval of development that does not consider geologic hazards) direct future growth away from areas of high seismic ground shaking for the purpose of avoiding or minimizing geologic hazards. Policies S-1.3 and S-1.7 (establish conditions/standards for geotechnical studies) would help to avoid ground shaking hazard exposure risks with future development through implementation of geotechnical study recommendations.

Area Plan Policies

There are no additional Area Plan policies related to ground shaking hazards.

Significance Determination

Implementation of the 2007 General Plan within the 2030 planning horizon could potentially result in adverse impacts related to ground shaking. The majority of new development proposed under the 2007 General Plan would not occur in areas of high probability for strong seismic ground shaking; rather, much of the proposed planning area development would be in areas of high probability for moderate ground shaking, mostly agricultural (wine-industry-related). Risks to agricultural development from ground shaking are minimal compared to risks to denser urban development. Nonetheless, primary mitigation for reducing risk would require new construction (including winery structures containing wine barrels) in Monterey County to comply with CBC Zone 4 seismic building criteria standards. These are designed to reduce ground shaking risks to acceptable levels by making new structures more resistant to seismic shaking damage, and they contain construction requirements that minimize the potential loss of life from an earthquake. Development in accordance with the 2007 General Plan and enforcement of the CBC would ensure that impacts related to potential ground shaking would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies as well as adherence to CBC standards would reduce impacts related to potential ground shaking to a less-than-significant level.

Buildout

Impact of Development with Policies

Buildout under the 2007 General Plan to 2092 would result in new urban and agricultural development in undeveloped areas beyond 2030 levels. New development could expose more persons and structures to geological hazards such as seismic ground shaking.

2007 General Plan Policies

The 2007 General Plan policies summarized above identify high seismic risk areas and place restrictions on future development in those areas to minimize adverse seismic ground shaking impacts.

Significance Determination

Buildout under the 2007 General Plan to 2092 could potentially result in adverse impacts related to fault rupture. The 2007 General Plan would result in more persons and structures in areas of high probability for strong and moderate ground shaking. However, new construction throughout the County will comply with CBC Zone 4 seismic building criteria standards that are designed to reduce ground shaking risks to acceptable levels. Development in accordance with the 2007 General Plan and enforcement of the CBC would ensure that impacts related to potential ground shaking would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies as well as adherence to CBC standards would reduce impacts related to potential fault rupture to a less-than-significant level.

Liquefaction

Impact GEO-3: Land uses and development consistent with the 2007 General Plan could expose property and structures to the damaging effects of ground subsidence hazards. This kind of geologic hazard

can be seismically triggered (e.g., liquefaction), caused by seasonal saturation of the soils and rock materials, or related to grading activities. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan within the 2030 planning horizon would result in new urban and agricultural development in undeveloped areas. As a result, more persons and structures would be exposed to geological hazards such as liquefaction and ground subsidence. Liquefaction would be harmful because it could cause collapse or overturning of structures, collapse of pavements, and in some cases lateral spreading.

The 2007 General Plan would result in more persons and structures in areas of shallow groundwater in the Salinas River floodplain and near Elkhorn Slough, which have moderate to high susceptibility to liquefaction hazards. Thus, liquefaction could be of concern in the Community Plan Areas of Castroville, Chualar, and Pajaro; and in the Rural Centers of Bradley, Lockwood, Pine Canyon (King City), San Lucas, and San Ardo (refer to Exhibit 4.4.3).

2007 General Plan Policies

The 2007 General Plan policies summarized below set forth comprehensive measures to minimize adverse liquefaction impacts.

Safety Element

Safety Element Policies S-1.1, S-1.2, S-1.5, S-1.6, and S-1.8 (restrict siting of land uses in identified hazard areas and limit approval of development that does not consider geologic hazards) direct future growth away from areas of high liquefaction risk for the purpose of avoiding or minimizing geologic hazards. Policies S-1.3 and S-1.7 (establish conditions/standards for geotechnical studies) would help to avoid liquefaction hazard exposure risks with future development through implementation of geotechnical study recommendations.

Area Plan Policies

There are no supplemental Area Plan policies that address liquefaction.

Significance Determination

Implementation of the 2007 General Plan within the 2030 planning horizon could potentially result in adverse impacts related to liquefaction. However, no new structures would be permitted without development of a site-specific geotechnical report and adherence to the recommendations outlined therein

for development on soils of potential liquefaction and subsidence. Specifically, Chapter 16.08 of the Monterey County Code requires that grading permit applications include soils engineering and engineering geology reports that provide "recommendations for grading procedures and design criteria for corrective measures when necessary, and opinions and recommendations covering adequacy of sites to be developed by the proposed grading" (Section 16.08.110). Standard geotechnical engineering procedures and soil testing, proper design, and quality control over construction can identify and mitigate liquefiable soils during site development. Modern soil engineering practices have improved substantially due to increased knowledge of soil types, their strengths, and groundwater conditions, as well as through the proper design and construction of fills and foundations. By using the best, most up-to-date standards, potential hazards related to subsidence and settlement damage—including liquefaction—can be reduced to levels that are generally considered acceptable. Thus, this requirement will identify problem soils and require mitigation when they are present. In addition, all new development would be built to CBC Zone 4 seismic building criteria standards, designed to reduce liquefaction risks to acceptable levels.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies, adherence to the CBC standards, and enforcement of the Monterey County Grading Ordinance would reduce impacts associated with liquefaction to a less-than-significant level.

Buildout

Impact of Development with Policies

Buildout under the 2007 General Plan to 2092 would result in new urban and agricultural development in undeveloped areas beyond 2030 levels. New development could expose more persons and structures to geological hazards such as liquefaction.

2007 General Plan Policies

The 2007 General Plan policies summarized above identify high seismic risk areas and place restrictions on future development in those areas to minimize adverse liquefaction impacts.

Significance Determination

Buildout under the 2007 General Plan to 2092 could potentially result in adverse impacts related to liquefaction. The 2007 General Plan would result

in more persons and structures in areas of high and moderate probability for liquefaction. However, new construction throughout the County will comply with CBC Zone 4 seismic building criteria standards that are designed to reduce liquefaction risks to acceptable levels. Development in accordance with the 2007 General Plan and enforcement of the CBC would ensure that impacts related to potential liquefaction would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies as well as adherence to the Monterey County Grading Ordinance and CBC standards would reduce impacts related to potential liquefaction to a less-than-significant level.

Slope Instability and Landslides

Impact GEO-4: Land uses and development consistent with the 2007 General Plan could expose people and structures to substantial damaging effects of landslides, including the risk of loss, injury, or death from downslope earth movement that may be slow or rapidly occurring. This kind of geologic hazard is commonly caused by earthquakes, seasonal saturation of soils and rock, erosion, or grading activities. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan within the 2030 planning horizon would result in new urban and agricultural development in undeveloped areas. As a result, more persons and structures could be exposed to geological hazards such as downslope earth movement if new development was located on or near slopes. Landslides resulting in earth and debris flow could result in structural damage or complete loss of structures, as well as injuries or death to persons.

According to the 2007 General Plan, development would be predominantly located in areas of flat relief where there is little or no risk of slope instability. However, there is some proposed residential and agricultural development in and near hilly areas that could be susceptible to landslides, particularly in the Rural Centers of Bradley, Lockwood, Pleyto, and Pine Canyon (King City) (refer to Exhibit 4.4.4).

2007 General Plan Policies

The 2007 General Plan and Area Plan policies summarized below set forth comprehensive measures to minimize slope instability and landslide impacts.

Safety Element

Safety Element Policies S-1.1, S-1.2, S-1.5, S-1.6, and S-1.8 (restrict siting of land uses in identified hazard areas and limit approval of development that does not consider geologic hazards) direct future growth away from areas of high landslide risk for the purpose of avoiding or minimizing geologic hazards. Policies S-1.3 and S-1.7 (establish conditions/standards for geotechnical studies) would help to avoid landslide hazard exposure risks with future development through implementation of geotechnical study recommendations.

Conservation and Open Space Element

Conservation and Open Space Element Policies OS-1.3 through OS-1.6 restrict ridgeline development. These policies would reduce the potential for slope instability resulting from construction and the risks to homes and persons that would otherwise be built on ridgelines.

Area Plan Policies

The following supplemental policies in the Area Plans address potential impacts from unstable slopes and landslides.

North County Area Plan

Policy NC-1.3 (encourage preservation of large acreages in higher elevations and on steeper slopes) would help to avoid landslide hazard exposure risks with future development by directing larger swaths of growth to occur at lower elevations and on flatter terrain.

Greater Salinas Area Plan

Policy GS-3.1 (promote preservation of land exceeding 25% slope) would help to avoid landslide hazard exposure risks with future development by directing growth away from areas with greater than 25% slope.

Greater Monterey Peninsula Area Plan

Policy GMP-4.1 (encourage preservation of redwood forest and chaparral habitat exceeding 25% slope) would help to avoid

landslide hazard exposure risks with future development by directing growth away from areas with greater than 25% slope.

Carmel Valley Master Plan

Policy CV-3.4 (promote sensitive siting and landscaping on hillsides and natural landforms altered by cutting, filling, grading, or vegetation removal) would help to avoid landslide hazard exposure risks with future development by directing careful growth on altered landforms and hillsides.

Toro Area Plan

Policy T-3.6 (encourage preservation of large acreages in higher elevations and on steeper slopes) would help to avoid landslide hazard exposure risks with future development by directing larger swaths of growth to occur at lower elevations and on flatter terrain.

Cachagua Area Plan

Policy CACH-3.2 (promote sensitive siting and landscaping on hillsides and natural landforms altered by cutting, filling, grading, or vegetation removal) would help to avoid landslide hazard exposure risks with future development by directing careful growth on altered landforms and hillsides.

Significance Determination

Implementation of the 2007 General Plan within the 2030 planning horizon could potentially result in adverse impacts related to landslides. However, no new structures would be permitted without development of a site-specific geotechnical report and adherence to the recommendations therein for development in areas susceptible to landslide. Specifically, Chapter 16.12 of the Monterey County Code (which comprises the County's Erosion Control Ordinance) prohibits construction activities that would lead to soil erosion or that would result in a permanent change to existing site on slopes greater than or equal to 25% (greater than 25% for development in the North County Land Use Plan) with exceptions being made only for special circumstances (Section 16.12.040). Section 21.66.010 of the Monterey County Code requires a conditional use permit for any development proposed on ridgelines. In addition, all new development would be built to CBC Zone 4 seismic building criteria standards, designed to reduce landslide risks to acceptable levels.

Mitigation Measures

No mitigation beyond the 2007 General Plan and Area Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies and respective Area Plan policies in addition to enforcement of the Monterey County Erosion Control Ordinance and the CBC would ensure that potential impacts related to slope instability and landslides would be less than significant.

Buildout

Impact of Development with Policies

Buildout under the 2007 General Plan to 2092 would result in new urban and agricultural development in undeveloped areas beyond 2030 levels. New development could expose more persons and structures to geological hazards such as landslides.

2007 General Plan Policies

The 2007 General Plan policies summarized above identify landslide susceptibility areas and place restrictions on future development in those areas to minimize adverse downward earth movement impacts.

Significance Determination

Buildout under the 2007 General Plan to 2092 could potentially result in adverse impacts related to landslides. The 2007 General Plan would result in more persons and structures in areas susceptible to landslide. However, new construction throughout the County will comply with CBC Zone 4 seismic building criteria standards designed to reduce slope stability and landslide risks to acceptable levels. Development in accordance with the 2007 General Plan and enforcement of the CBC would ensure that impacts related to potential landsliding would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies as well as adherence to the Monterey County Grading Ordinance and CBC standards would reduce impacts related to potential landslides to a less-than-significant level.

Soil Erosion Hazards

Impact GEO-5: Erosion from activities and land uses consistent with the 2007 General Plan could result in erosion hazards. (Less-Than-Significant Impact with Mitigation.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan within the 2030 planning horizon would result in new urban and agricultural development in undeveloped areas. As a result, more persons and structures could be exposed to geological hazards such as erosion. Erosion results in the loss of topsoil that may reduce yield of crops or forage and cause sedimentation (siltation) problems downstream. Extreme cases of erosion can lead to landslides.

The 2007 General Plan would result in more persons and structures in areas of potential erosion hazard in the hilly and mountainous areas of Fort Ord/East Garrison and Pine Canyon (King City) Community Plan Areas and the Lockwood Rural Center (refer to Exhibit 4.4.5). In addition, agricultural development could occur on the uncultivated slopes in the Salinas Valley (particularly in portions of the Central/Arroyo Seco/River Road Segment and Jolon Road Segment Wine Corridors) that could put persons and winery structures in areas of potential erosion hazards.

2007 General Plan Policies

The 2007 General Plan and Area Plan policies summarized below set forth comprehensive measures to minimize adverse erosion impacts.

Conservation and Open Space Element

Conservation and Open Space Element Policies OS-3.1, OS-3.2, and OS-3.5 (require Best Management Practices be implemented and encourage continuance of federal, state, and local erosion control programs) would help to control erosion with future development through compliance with best management practices and all levels of government regulation regarding erosion prevention practices. Policies OS-3.3 and OS-3.7 (establish criteria for erosion-related surveys and promote preparation of watershed plans for state-designated impaired waterways) would help to avoid erosion risks with future development through implementation of erosion-related survey and watershed plan recommendations. Policies OS-3.4 and OS-3.6 (map areas of steep slopes and establish criteria for residential development in such areas) direct future growth away from areas of steep slopes for the purpose of avoiding or minimizing erosion hazards. Policy OS-3.5 (sets forth requirements for a ministerial permitting system for existing lots of record) would help to avoid erosion hazards with future development through implementation of ministerial permit erosion control standards.

Agriculture Element

Agriculture Element Policy AG-5.1 (promote soil conservation programs) would help to avoid erosion hazard exposure risks with future development through implementation of soil conservation program measures that reduce soil erosion and increase soil productivity. Policy AG-5.4 (encourage policies and programs to protect and enhance surface water and groundwater resources) would help to avoid erosion hazard exposure risk with future development through compliance with policies and programs that limit sedimentation of surface and groundwater resources.

Safety Element

Safety Element Policies S-1.1, S-1.2, S-1.5, S-1.6, and S-1.8 (restrict siting of land uses in identified hazard areas and limit approval of development that does not consider geologic hazards) direct future growth away from areas of high erosion risk for the purpose of avoiding or minimizing geologic hazards. Policies S-1.3 and S-1.7 (establish conditions/standards for geotechnical studies) would help to avoid erosion hazard exposure risks with future development through implementation of geotechnical study recommendations. In addition, Policy S-1.9 (prepare erosion control plan measures to reduce moderate and high erosion hazards) would help to avoid erosion hazard exposure risks with future development through implementation of erosion control plan recommendations that would be put forth by a California-licensed civil engineer or a California-licensed landscape architect.

Area Plan Policies

The following supplemental policies in the Area Plans address potential erosion impacts.

North County Area Plan

Policy NC-1.3 (encourage preservation of large acreages in higher elevations and on steeper slopes) would help to avoid erosion hazard exposure risks with future development by directing larger swaths of growth to occur at lower elevations and on flatter terrain. Policy NC-5.3 (encourage conjoint soil, water, and resource protection programs) would help to avoid or minimize erosion with future development through participation in cooperative soil conservation, water quality protection, and resource restoration programs with neighboring jurisdictions.

Central Salinas Valley Area Plan

Central Salinas Area Plan Policy CSV-5.2 (prohibit new recreation and visitor-serving commercial uses that would produce runoff) would direct growth of runoff producing land uses away from areas that would result in erosion. Policy GS-3.1 (promote preservation of land exceeding 25% slope) would help to avoid erosion hazard exposure risks with future development by directing growth away from areas with greater than 25% slope.

Greater Monterey Peninsula Area Plan

Policy GMP-4.1 (encourage preservation of redwood forest and chaparral habitat exceeding 25% slope) would help to avoid erosion hazard exposure risks with future development by directing growth away from areas with greater than 25% slope.

Carmel Valley Master Plan

Policy CV-3.4 (promote sensitive siting and landscaping on hillsides and natural landforms altered by cutting, filling, grading, or vegetation removal) would help to avoid erosion hazard exposure risks with future development by directing careful growth on altered landforms and hillsides. Policies CV-3.8 and CV-3.9 (require retention of riparian vegetation and willow cover along the Carmel River) would help to avoid erosion along the Carmel River with future development through plantings along the river banks. Policy CV-4.1 also establishes specific standards to reduce erosion and runoff potential associated with future development.

Toro Area Plan

Policy T-3.6 (encourage preservation of large acreages in higher elevations and on steeper slopes) would help to avoid erosion hazard exposure risks with future development by directing larger swaths of growth to occur at lower elevations and on flatter terrain. Policy T-4.1 (prohibit practices that contribute to siltation and flooding of Toro Creek) would help to avoid erosion into and sedimentation of Toro Creek with future development.

Cachagua Area Plan

Policy CACH-3.2 (promote sensitive siting and landscaping on hillsides and natural landforms altered by cutting, filling, grading, or vegetation removal) would help to avoid erosion hazard exposure risks with future development by directing careful growth on altered landforms and hillsides.

South County Area Plan

Policy SC-5.2 (encourage conjoint soil, water, and resource protection programs) would help to avoid or minimize erosion with future development through participation in cooperative soil conservation, water quality protection, and resource restoration programs with neighboring jurisdictions.

Master Plan Policies

Fort Ord Master Plan

Fort Ord Master Plan Soils and Geology Policies A-2, A-3, and A-4 (prepare and monitor erosion control plans that meet requirements of a Stormwater Pollution Prevention Plan) would help to avoid or minimize erosion with future development through implementation and monitoring of Stormwater Pollution Prevention Plan erosion control requirements.

Significance Determination

Implementation of the 2007 General Plan within the 2030 planning horizon could potentially result in adverse impacts related to erosion. Accelerated erosion is a widespread impact that may be reduced but not entirely eliminated in areas of moderate to steep topography in Monterey County. Causes include vegetation removal, improper farming practices, grading for roadways and construction, and improper diversion and discharge of water. However, no new structures would be permitted on slopes greater than 25 to 30%, with limited, mitigated exceptions. Specifically, the County Erosion Control Ordinance (Chapter 16.12 of the County Code) prohibits development on slopes greater than 30%, requires implementation of an Erosion Control Plan, regulates the control of runoff, requires that creek disturbance be avoided, regulates land clearing, and prohibits grading activities during winter.

Implementation of the AWCP could induce property owners to change crop cover to vineyards or to plant vineyards on uncultivated slopes, thereby increasing the potential for soil erosion. The potential for soil erosion is particularly acute if property owners cultivate slopes so that rows are parallel to the slope gradient. However, an agricultural permit process would need to be established prior to allowing any conversion of slopes greater than 25% to agricultural lands.

The NPDES program governs water quality, including discharge of sediments into navigable water bodies. In Monterey County, the Central Coast RWQCB is charged with enforcing NPDES requirements, including runoff management programs that include

Best Management Practices to control erosion and sedimentation. Future development proposed in the 2007 General Plan would be required to apply and comply with Central Coast RWQCB NPDES erosion control permits. Phase I of the permit process would cover sites with construction disturbance greater than 1 acre, which includes most residential subdivisions and commercial developments. In addition, Phase II of the permit process would cover sites with construction disturbance less than 1 acre. Thus, 2007 General Plan implementation projects of all sizes would be covered by some phase of NPDES permit.

General Plan implementation activities would be subject to federal, state, and local erosion control programs, as well as the policies of the 2007 General Plan and Area Plans. In addition, by incorporating modern erosion control practices such as the use of biotechnical bank stabilization and geotextile fabrics to hold soil in place as well as various types of planting, soil erosion on most disturbed slopes can be greatly reduced. However, the development and implementation of erosion control measures on steep slopes and areas of highly erodible soils can be challenging and often are only partially successful, and high erosion hazards are widespread throughout the County. Therefore, the potential remains for significant erosion hazards to occur from development on individual lots of record and new hillside agricultural cultivation projects. The 2007 General Plan policies and the existing federal, state, and local erosion control requirements do not adequately mitigate this potentially significant impact to a less-than-significant level. Mitigation Measure BIO-2.1 (see Section 4.9, Biological Resources) would reduce the significance of this impact.

Mitigation Measures

BIO-2.1: Stream Setback Ordinance.

No additional mitigation beyond the General Plan and Area Plan goals and policies is necessary.

Significance Conclusion

Mitigation Measure BIO-2.1 would reduce this potentially significant impact to a less-than-significant level by restricting development near streams and thereby reducing the risk for construction and other activities related to development to cause bank failure or erosion. This measure also ensures that erosion from other activities will not directly flow into creeks and streams. Thus, with compliance with 2007 General Plan and respective Area Plans policies; adherence to federal, state, and local erosion control regulations (i.e., County Grading Ordinance and NPDES program); implementation of the 2007 General Plan would result in a less-than-significant impact related to erosion hazards.

Buildout

Impact of Development with Policies

Buildout under the 2007 General Plan to 2092 would result in new urban and agricultural development in undeveloped areas beyond 2030 levels. New development could expose more persons and structures to geological hazards such as erosion.

2007 General Plan Policies

The 2007 General Plan policies summarized above identify erosion susceptibility areas and place restrictions on future development in those areas to minimize adverse erosion impacts.

Significance Determination

Buildout under the 2007 General Plan to 2092 could potentially result in adverse impacts related to erosion. The 2007 General Plan would result in more persons and structures in areas susceptible to erosion. General Plan implementation activities would be subject to federal, state, and local erosion control programs, as well as the policies of the 2007 General Plan and Area Plans. However the potential remains for significant erosion hazards to occur from development on individual lots of record and new hillside agricultural cultivation projects. The 2007 General Plan policies and the existing federal, state, and local erosion control requirements do not adequately mitigate this potentially significant impact to a less-than-significant level. Mitigation Measure BIO-2.1 (see Section 4.9, Biological Resources) would be in place to reduce the significance of this impact.

Mitigation Measures

BIO-2.1: Stream Setback Ordinance.

No additional mitigation beyond the General Plan and Area Plan goals and policies is necessary.

Significance Conclusion

Mitigation Measure BIO2.1 would reduce this potentially significant impact to a less-than-significant level. Thus, with compliance with 2007 General Plan and respective Area Plan and Area Plan policies; adherence to federal, state, and local erosion control regulations (i.e., County Grading Ordinance and NPDES program, buildout of the 2007 General Plan would result in a less-than significant impact related to erosion hazards.

Expansive Soils and Unstable Geologic Units

Impact GEO-6: Land uses and development consistent with the 2007 General Plan could expose property improvements to potential adverse effects from expansive soils. Expansive soils can damage improvements, especially structures such as residential buildings, small commercial buildings, and pavements. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan within the 2030 planning horizon would result in new urban and agricultural development in undeveloped areas. As a result, more persons and structures would be exposed to geological hazards such as the effects from expansive soils. Newly constructed buildings, pavements, and utilities could be damaged by differential settlement due to soil expansion and contraction. Movements may cause foundations to crack, various structural portions of the building to be distorted, and doors and windows to warp so that they do not function properly. Utilities also may be affected. These variations in ground settlement may ultimately lead to structural failure and damage to infrastructure.

Soil surveys provide general information about soils in an area. They are available from the Natural Resources Conservation Service, U.S. Department of Agriculture. However, maps provide only generalized locations. Only geotechnical tests can determine the existence of and corresponding swell potential of expansive soils at a site and, thus, the probability for structural damage.

2007 General Plan Policies

The 2007 General Plan policies summarized below set forth comprehensive measures to minimize adverse expansive soil and unstable geologic unit impacts.

Safety Element

Safety Element Policies S-1.1, S-1.2, S-1.5, and S-1.8 (restrict siting of land uses in identified hazard areas and limit approval of development that does not consider geologic hazards) direct future growth away from areas of expansive soil risk for the purpose of avoiding or minimizing geologic hazards. Policies S-1.3 and S-1.7 (establish conditions/standards for geotechnical studies) would help to avoid unstable geologic unit and expansive soil hazard exposure

risks with future development through implementation of geotechnical study recommendations.

Area Plan Policies

No supplemental Area Plan policies address expansive soils or unstable geologic units.

Significance Determination

New development in accordance with the 2007 General Plan could result in construction activities overlying expansive or unstable soils. However, no new structures would be permitted without development of a site-specific soil sampling and laboratory soils testing report and adherence to the recommendations outlined therein, such as the proper subsoil preparation, drainage, and foundation design for constructing on more unstable soils. Procedures used in expansive soils testing are found in the 2001 CBC, adopted by Monterey County. According to the CBC, foundations for structures resting on soil with an expansion index greater than 20 require special design consideration. In addition, the Monterey County Grading Ordinance (Chapter 16.08 of the County Code) requires special treatment for grading sites with difficult soils. These limit the potential for development to occur without design features to mitigate the risk.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

Implementation of 2007 General Plan policies as well as enforcement of the CBC would reduce potential expansive soil impacts. CBC requirements ensure that design and construction conform to recommendations from a geotechnical or soils investigation. This includes procedures for handling expansive soils through such techniques as replacement of expansive soils with non-expansive engineered fill, lime treatment, moisture conditioning, and other techniques. Consequently, potential expansive soil impacts would be less than significant.

Buildout

Impact of Development with Policies

Buildout under the 2007 General Plan to 2092 would result in new urban and agricultural development in undeveloped areas beyond 2030 levels. New development could expose more persons and structures to geological hazards such as expansive soils.

2007 General Plan Policies

The 2007 General Plan policies summarized above identify high seismic risk areas and place restrictions on future development in those areas to minimize adverse expansive soil impacts.

Significance Determination

Buildout under the 2007 General Plan to 2092 could potentially result in adverse impacts related to expansive soils. The 2007 General Plan could result in more persons and structures in areas of expansive soils. However, new construction throughout the County will comply with CBC Zone 4 seismic building criteria standards designed to reduce expansive soil and unstable geologic unit risks to acceptable levels. Development in accordance with the 2007 General Plan and enforcement of the CBC would ensure that impacts related to potential expansive soils would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies as well as adherence to CBC standards would reduce impacts related to potential expansive soils to a less-than-significant level.

Septic Systems and Alternative Wastewater Systems

Impact GEO-7: Construction of septic tanks or alternative wastewater disposal systems on soils incapable of adequately supporting such systems could damage improvements and adversely affect groundwater resources. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan to the 2030 planning horizon would result in new urban and agricultural development in undeveloped areas. As a result, more persons and structures would be exposed to hazards related to construction of septic tanks on soils incapable or adequately supporting such systems. This may result in contaminated surface water or groundwater.

Septic tanks could be associated with development in the Salinas Valley, particularly within the Central/Arroyo Seco/River Road Segment, Metz Road

Segment, and Jolon Road Segment wine corridors and the River Road, Pine Canyon (Kings City), San Lucas, and San Ardo Rural Centers.

2007 General Plan Policies

The 2007 General Plan and Area Plan policies summarized below set forth comprehensive measures to avoid and minimize adverse impacts associated with septic tank systems.

Public Services Element

Public Services Element Policies PS-4.1, PS-4.2, PS-4.3, and PS-4.5 (promote use of wastewater collection and treatment systems for new development) would help avoid the adverse impacts of impaired surface and groundwater quality that could potentially occur with installation of septic tank systems through determent of the use of septic and alternative wastewater systems. Policy PS-4.8 (require County to establish septic system and alternative wastewater system criteria) would direct future development to comply with septic tank criteria such as minimum lot size, location of wells, the capacity of the system, and other factors related to soil suitability in order to minimize risks to groundwater resources.

Area Plan Policies

The following supplemental Area Plan policies address impacts related to on-site septic systems.

Carmel Valley Master Plan

Carmel Valley Master Plan Policy CV-5.5 (require geologic and soils surveys if including on-site septic system) would help to ensure that future development with proposed septic systems would not contaminate the groundwater aquifer through implementation of geologic and soil survey recommendations. This policy would specifically require review for proper siting and design in accordance with the standards of the *Carmel Valley Wastewater Study*.

Central Salinas Area Plan

Central Salinas Area Plan Policy CSV-5.2 (require recreation and visitor-serving commercial use septic systems to meet RWQCB Basin Plan requirements) would help to minimize potential impairment of groundwater quality from septic systems through implementation of RWQCB Basin Plan measures related to septic systems.

Significance Determination

New development in accordance with the 2007 General Plan could result in installation of septic tank systems for wastewater disposal, especially in more rural areas of the County containing wine-related facilities. However, most General Plan development is not anticipated to be on septic, as population growth and respective new development is anticipated to occur primarily within the community planning areas rather than the rural or winery corridor areas. Nonetheless, no septic tanks would be permitted without development of a site-specific geotechnical report and adherence to the recommendations outlined therein related to installation of septic tanks systems. Finally, any alternative system management program must be consistent with RWQCB requirements, which would ensure that disposal does not degrade surface waters.

Mitigation Measures

No mitigation beyond the 2007 General Plan and Area Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan policies would promote the use of wastewater collection and treatment systems rather than septic tanks and would establish comprehensive standards for septic and alternative wastewater systems. Consequently, potential septic system impacts would be less than significant.

Buildout

Impact of Development with Policies

Buildout under the 2007 General Plan to 2092 would result in new urban and agricultural development in undeveloped areas beyond 2030 levels. New development could expose more persons and structures to geological hazards associated with use of septic tanks.

2007 General Plan Policies

The 2007 General Plan policies summarized above place restrictions on future development in terms of installation of septic tank systems.

Significance Determination

Buildout under the 2007 General Plan to 2092 could potentially result in adverse impacts related to septic tanks. However, new construction throughout the County would comply with 2007 General Plan and Area Plan policies that would ensure that impacts related to septic tanks would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan and Area Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan and Area Plan policies would reduce impacts related to septic tanks to a less-than-significant level.

Tsunami, Seiche, and Mudflow Hazards

Impact GEO-8: Land use activities and development consistent with the 2007 General Plan could expose persons and property to tsunami, seiche, or mudflow hazards. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan within the 2030 planning horizon would result in new urban and agricultural development in undeveloped areas. As a result, more persons and structures would be exposed to hazards related to tsunami, seiche, or mudflow.

Development is not proposed for the immediate coastal areas or proximate to Lakes Nacimiento and Lake San Antonio (two large inland water bodies). Development is proposed for areas of the Bradley, Lockwood, Pleyto, and Pine Canyon (King City) rural areas.

2007 General Plan Policies

The 2007 General Plan contains policies that address development in areas prone to slope hazards such as landslides and mudflows. These policies are summarized in the discussion for Impact GEO-4.

Area Plan Policies

No Area Plan policies address the topics of tsunami, seiche, or mudflow hazards.

Significance Determination

The probability of seiche and mudflow are low in Monterey County. The areas with the greatest possibility of such hazards are not populated. Portions of the coast could be subject to inundation in the case of a tsunami. However, this risk has been identified in the certified Local Coastal Program, and protective policies have been put in place to minimize risk to new

development. Therefore, there would be no increase in tsunami or seiche hazards over existing levels.

Mudflows have occurred in recent geologic time in the coastal areas near Big Sur, which contain numerous steep slopes. Mudflows are extremely rare outside of that area, particularly in the inland portions of the County. Nonetheless, there is a remote possibility that mudflows could inundate inland areas where significant slopes are located. However, in terms of mudflow, no development would be permitted on slopes greater than 30% without mitigated exception. In addition, new development would be required to meet all applicable standards of the CBC, which includes standards related to slope stability. Therefore, adherence to 2007 General Plan policies and the CBC would ensure that no additional exposure to mudflow hazards would be created.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

With adherence to 2007 General Plan policies and compliance with the CBC, impacts related to tsunami, seiche, and mudflow hazards would be less than significant.

Buildout

Impact of Development with Policies

Buildout under the 2007 General Plan to 2092 would result in new urban and agricultural development in undeveloped areas beyond 2030 levels. New development could expose more persons and structures to geological hazards associated with tsunami, seiche, and mudflow.

2007 General Plan Policies

The 2007 General Plan policies summarized above set forth comprehensive measures to minimize adverse mudflow and landslide impacts.

Significance Determination

Buildout under the 2007 General Plan to 2092 could potentially result in adverse impacts related to tsunami, seiche, and mudflow. However, new construction throughout the County would comply with 2007 General Plan and Area Plan policies that would ensure that impacts related to tsunami, seiche, and mudflow would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan and Area Plan policies is necessary.

Significance Conclusion

Implementation of the 2007 General Plan and Area Plan policies would reduce impacts related to tsunami, seiche, and mudflow to a less-than-significant level.

4.4.5 Level of Significance after Mitigation

All impacts related to geology, soils, and seismicity would be less than significant with mitigation and compliance with federal, state, and local regulations.

4.5 Mineral Resources

4.5.1 Abstract

The primary mineral commodities currently mined in Monterey County are sand, gravel, and petroleum. This section characterizes the mineral resources setting and regulatory framework applicable to mineral resources in Monterrey County.

The 2007 General Plan policies affect mineral resources in the County by defining methods for their long-term protection. The 2007 General Plan policies guide land use activities in order to avoid adverse impacts to identified mineral resources. This section also evaluates the potential loss of availability of known mineral resources due to land use conversions associated with the implementation of the 2007 General Plan.

All potential mineral resource impacts from development and land use activities by the 2007 General Plan would be less than significant and would not require mitigation.

4.5.2 Existing Setting

This section describes the existing setting related to mineral resource production in Monterey County.

Historic mineral production in Monterey County included sand and gravel mining for construction materials, mining for industrial materials (diatomite, clay, quartz, and dimension stone) and metallic minerals (chromite, placer gold, manganese, mercury, platinum, and silver).

The public depends on several categories of minerals found in Monterey County for a variety of everyday uses. For example, minerals such as sand and gravel are used to make concrete for buildings and asphalt to pave roads. Crude oil, natural gas, and coal are fuel minerals used for producing petroleum and petrochemicals.

The predominant non-metallic minerals found in the county include sand and gravel, limestone and dolomite, gemstones (mainly jade and jasper), asbestos, barite, clay, diatomite, feldspar, phosphate, sodium compounds, and stone.

Of the non-metallic minerals, construction-grade aggregate (sand, gravel, and crushed stone) is the most abundant and commonly used mineral resource in the county.

4.5.2.1 Non-Metallic Minerals

Sand and Gravel

The California Surface Mining and Reclamation Act (SMARA) of 1975 requires the classification of land into Mineral Resources Zones (MRZs) according to known or inferred mineral potential of that area. The classification process is based solely on the underlying geology without regard to existing land use or land ownership. The primary goal of the mineral land classification is to ensure that the mineral potential of the land is recognized by local government decision-makers and is considered before making land use decisions that could preclude mining.

Aggregate resources are classified by the State Geologist into four mineral resources zones based on the likelihood of the presence of mineral deposits and their economic value. This mineral land classification is used to help identify and protect mineral resources in areas within the State subject to urban expansion or other irreversible land use changes that would preclude future mineral extraction. The four divisions are "Areas of No Mineral Resource Significance (MRZ-1)," "Areas of Identified Mineral Resource Significance (MRZ-2)," "Areas of Undetermined Mineral Resource Significance (MRZ-3)," and "Areas of Unknown Mineral Resources Significance (MRZ-4). See the *Regulatory Setting* section of this section for more detailed information about the MRZ classifications.

Exhibit 4.5.1 displays the location of the MRZs in Monterey County, as well as the location of existing mines and oil wells. Nearly all of the areas classified as MRZ-1 are located in the urbanizing areas around Salinas, Castroville, and the Pajaro region. These are areas where, based on available geologic studies and information, no significant mineral resources were identified. The only area in Monterey County designated as MRZ-2, or as an area of identified mineral resource significance, is in the vicinity of Marina, Sand City and Seaside. Monterey and Pacific Grove are designated as MRZ-3, with undetermined mineral resource significance. Land near Del Rey Oaks is designated MRZ-4, or as an area of unknown mineral resource significance. At present, no aggregate resources have been classified beyond the more urbanized northern portions of the County. There are no areas designated by the State Geologist as MRZ in southern Monterey County. However, as shown in Table 4.5-1 and in Exhibit 4.5.1, there are multiple existing sand and gravel facilities located in southern Monterey County, including the Brinan Pit located in San Ardo and the Clark Pit located in King City. However, because these areas were not urbanizing as swiftly as the northern portion of the County, they were not evaluated by the State Geologist.

Table 4.5-1. Existing Aggregate Resources in Monterey County

Name	Operator	Location	Product
Arroyo Seco	Clark	Arroyo Seco	Sand, gravel
BLM Rock Pile	Clark	San Ardo	Stone
Brinan Pit	Swift Tectonics, Inc.	San Ardo	Sand, gravel
Chalone Creek	Swift Tectonics, Inc.	Soledad	Sand, gravel
Clark Pit	William J. Clark Trucking Service	King City	Sand, gravel
Del Monte Quarry	Granite Construction	Del Monte Forest	Sand, gravel
DKD Echo Valley DG Pit	DKD	Prunedale	Sand, gravel
Echenique Pit	Swift Tectonics	San Ardo	Sand, gravel
Jefferson Pit	Don Chapin Co., Inc.	Marina	Sand
Handley Mine	Granite Construction	Gonzales	Sand, gravel
Hidden Canyon	San Benito Supply Inc.	Greenfield	Crushed stone
Lapis	RMC Lonestar	Marina	Sand
Metz	Granite Construction Co.	Greenfield	Sand, gravel
Pine Canyon	Granite Construction	Salinas	Sand, gravel
Stonewall Canyon	Syar Industries	Soledad	Crushed stone

Source: California Department of Conservation, Office of Mine Reclamation 2008. *AB3098 Mine Reclamation List.*

The California Geologic Survey estimates that the Monterey Bay Production-Consumption Region, which includes Monterey, San Benito, Santa Cruz, and southern Santa Clara Counties, will require 379 million tons of aggregate through the year 2047. Currently, with only 269 million tons of permitted reserves, it is estimated that there is only enough aggregate to supply the region until 2033, resulting in an aggregate shortfall (California Geological Survey 1987).

In addition, the Department of Conservation forecasts a 30-percent shortfall of construction aggregates statewide over the next four decades (Hill 2006). The development of new and a gravel mines, along with aggregate recycling would likely be necessary to meet the projected aggregate shortfall in the Monterey Bay Production-Consumption Region.

Limestone and Dolomite

Limestone is an important mineral used in cement, agriculture, sugar refining, and glass manufacturing. Limestone, some of which is metamorphosed to marble, and dolomite are found mainly in the Gabilan Range and in the Santa

Lucia Range, most notably the Pico Blanco limestone deposit near Big Sur (California Division of Mines and Geology 1973). Except for the dolomite in the Natividad area near Salinas, there has been no commercial development of these deposits. The Natividad dolomite deposit in the Gabilan Range is an important source of raw material for extracting magnesium (Perozzo 2007).

Limestone is locally abundant in the Santa Lucia Range; however, most deposits have little economic value because of their remote location. The largest and most important are the extensive deposits at Pico Blanco near Big Sur. The Pico Blanco limestone deposits have a high purity and high calcium content, which make the limestone suitable for whiting and as an ingredient in paints, plastic fillers, and rubber. In response to a petition from the Granite Rock Company, the State Geologist evaluated the Pico Blanco deposits. The State Geologist classified areas owned by the Granite Rock Company as in the MRZ-2, indicating that significant mineral reserves are present (Exhibit 4.5.1). However, the lack of access to the Pico Blanco limestone deposits and concerns about the environmental impacts to the Big Sur area make mining of this limestone deposit difficult. In addition, in 1987, the California Coastal Commission denied the Granite Rock Company a use permit to mine in this area of the California coast.

4.5.2.2 Metallic Minerals

The major metallic minerals found in Monterey County include chromite, copper, gold, lead, manganese, mercury, molybdenum, silver, tungsten, and uranium. Of these minerals only chromite, gold, and mercury were produced in commercial quantities from the 1850s to the 1950s (Perozzo 2007).

Gold was widely prospected in Monterey County following the Gold Rush in the Sierra Nevada in the 1850s (Breschini 1983). Most of the gold occurs as vein deposits associated with Franciscan rock in the Los Burros Mining District near Cape San Martin on the Big Sur Coast. Minor amounts of gold were found in placer deposits in the Jolon area, the Carmel River, and the Cholame Valley. Despite the widespread prospecting, only a small amount of gold was recovered.

Chromite is used mainly as an alloy for steel and for plating metal. It was also stockpiled by the U.S. Government as part of the Strategic Mineral Program during World War II. Known deposits in Monterey County are associated with Franciscan Complex and serpentine in the Los Burros Mining District and in the Diablo Range (Perozzo 2007). The Los Burros deposits in Lilly Group and South Slope Mine were more productive than the Diablo Range deposit at Mee Ranch.

Mercury ore, more commonly known as quicksilver, was widely mined for its use in the amalgamation of gold and silver from their ores. The host rock for quicksilver deposits in Monterey County is cinnabar, found in silicacarbonate rock associated with the Franciscan Complex. Most of the mercury was produced in Parkfield, with a small amount near Dutra Creek (in the southwestern corner of Monterey County), and in Bryson.

4.5.2.3 Fuel Minerals

Oil

The Monterey Formation of California is part of a wide swath of unique sediments deposited around the Pacific Rim during the Miocene period, between about 17.5 and 6 million years ago (Behl 1998). The sediments in this formation are rich in organic matter, and its strata have been extensively investigated and mapped for petroleum exploration. This is a major oil-producing geological formation, and it provides the source rock for much of the oil and gas in California (Behl 1998).

Substantial oil reserves are believed to underlay parts of the Salinas Valley. The San Ardo Oil Field is the largest oil field in Monterey County. It is located in the lower Salinas Valley, about five miles south of the small town of San Ardo (Exhibit 4.5.1). The Energy Information Agency of the United States Department of Energy reports that the San Ardo oil field produced 3.2 million gallons of oil in 2006, which ranks the San Ardo Oil Field as forty-first in the nation in terms of oil production (U.S. Energy Information Administration 2006).

Other oil fields in the Salinas Valley include the Lynch Canyon, McCool Ranch, Monroe Swell, Quinado Canyon, and Paris Valley fields. Only San Ardo and King City have produced significant quantities of oil. Wildcat oil wells also were drilled at Fort Ord and Laguna Seca, in the Spreckels foothills, and in Seaside. None of these wells produced significant quantities of oil.

Coal

Historically, several coal deposits in Monterey County were commercially produced at the turn of the century. Two of these deposits were in the Diablo Range, in the southeastern part of the county. The first and most successful was the Stone Canyon mine. The Stone Canyon mine produced about 250,000 tons of coal from 1870 to 1935. A large amount of infrastructure, including a railway and tramway were built to bring the coal to market. The other Diablo Range coal deposit is near Priest Valley, located halfway between Coalinga and King City on Highway 198. Two mine shafts and 75 feet of drifts were excavated, but no production is recorded from this area. At this time, there is no known coal production underway in Monterey County, nor is coal production anticipated in the near future.

4.5.2.4 Abandoned Mines

As discussed above, existing mining operations in Monterey County are regulated by the State of California under SMARA. However, older mines that were abandoned prior to 1975 are not regulated by SMARA. Exhibit 4.5.2 depicts the locations of several recorded abandoned gold, mercury, and coal

mines of potential concern in Monterey County. As shown on Exhibit 4.5.2, the Plaskett Mines, Buclimo Mine and Old Murray Mine are located within the boundaries of the Los Padres National Forest and outside of the jurisdiction of the County. The Stone Canyon Mine, Partiquin Mine and Gillette Mines are located in a remote, mountainous area on the far eastern edge of the South County Area Plan.

Some of these mines may have been filled in, while others may still have open access. In addition to the public safety risk from entering improperly abandoned mines, some of the mines may be leaching acidic waters or heavy metals into local drainages. Proper closure of these mines is prudent and public funding may be available through State and Federal agencies to accomplish closure.

In California, abandoned mines are regulated by both the Federal government and State agencies. Federal agencies include the EPA and the U.S. Department of Labor, Mine and Safety Administration. State agencies include the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Board (RWQCB), and the California Department of Conservation Office of Mine Reclamation (OMR). These agencies have authority in the mitigation and reclamation of these historic abandoned mines (Central Valley Regional Water Quality Control Board 2007).

Pollution and water quality impacts from abandoned mines in Monterey County are beyond the scope of required CEQA analysis for mineral resources and are not addressed further in this section.

4.5.3 Regulatory Framework

The management of mineral resources is subject to numerous laws and regulations. Summaries of state and local laws related to the management of mineral resources are presented in this section.

4.5.3.1 State

Surface Mining and Reclamation Act of 1975 (SMARA)

As discussed above under the *Existing Setting* section, SMARA (Public Resources Code Section 2710 et seq.) mandated the initiation by the State Geologist of mineral land classifications in order to identify and protect mineral resources in areas within the State subject to urban expansion or other irreversible land uses which would preclude mineral extraction. SMARA was enacted in response to land use conflicts between urban growth and essential mineral production. SMARA also allowed the State Mining and Geology Board (SMGB), after receiving classification information from the State Geologist, to designate lands containing mineral deposits or regional and statewide significance (California Geological Survey, 1999). Construction aggregate was

selected by the SMGD to be the initial commodity targeted for classification because of its importance to society, its unique economic characteristics, and the imminent threat that continuing urbanization poses to that resource. In 1980, SMARA was amended to also provide the classification of non-urban areas subject to land-use threats incompatible with mining. Currently, the State Geologist's SMARA classification activities are carried out under a single program for urban and non-urban areas of the state.

The provisions of SMARA are administered by Monterey County. In accordance with SMARA, permits are required for all mining industries commencing operation on or after January 1, 1976.

Classification of land within the State of California takes place according to a priority list that was established by the SMGB in 1982, or when the SMGB is petitioned to classify a specific area. The SMGB established MRZs to designate lands that contain mineral deposits. Lands designated MRZ-2 are to be protected, as feasible, from land uses that would eliminate their future availability. Throughout California, only construction-grade aggregate minerals are classified by the State Geologist. The classifications used by the State to define MRZs are as follows:

- MRZ-1: Applies to areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists of their presence.
- MRZ-2: Applies to areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists of their presence.
- MRZ-3: Applies to areas containing mineral deposits, the significance of which is undetermined and cannot be evaluated.
- MRZ-4: Applies to areas where available information is inadequate for assignment to any other zone (i.e., where there is not enough information available to determine the presence or absence of mineral deposits).

According to the Guidelines for the Classification and Designation of Mineral Lands, there are two general categories to exclude lands from an MRZ-2 designations, the first is an economic exclusion and the second a social exclusion (California Geological Survey 1999). Social exclusions include cemeteries, public parks and recreation areas, schools, hospitals, prisons and military bases and reservations. Economic exclusions include the following:

- Residential areas, and areas committed to residential development, such as approved tracts,
- Commercial areas with land improvements (buildings)
- Industrial areas (buildings and adjacent storage and parking facilities)
- Major public and private engineering projects, such as canals, freeways, bridges, airports, dams, and railroads.
- Small areas isolated by urbanization (generally less than 40 acres).

AB 3098 List

The Office of Mine Reclamation periodically publishes a list of mines regulated under SMARA that meet provisions set forth under California's Public Resources Code, Section 2717(b). This list is generally referred to as the AB 3098 List, in reference to the 1992 legislation that established it. Sections 10295.5 and 20676 of the Public Contract Code preclude mining operations that are not on the AB 3098 List from selling sand, gravel, aggregates or other mined materials to state or local agencies (California Department of Conservation 2008).

For the Office of Mine Reclamation to place a mining operation on the AB 3098 List, the operation must meet all of the following conditions:

- The operation has an approved reclamation plan;
- The operation has an approved financial assurance;
- The operation has filed its annual report;
- The operation has paid its reporting fee;
- The operation has had its annual inspection by the lead agency which reflects the operation is in full compliance with the law.

California Division of Oil, Gas and Geothermal Resources

The California Division of Oil, Gas and Geothermal Resources (DOGGR) is mandated by Section 3106 of the Public Resources Code (PRC) to supervise the drilling, operation, maintenance and abandonment of oil wells for the purpose of preventing damage to life, health, property, and natural resources. DOGGR is charged with implementing Section 3208.1 of the PRC. The Construction-Site Plan Review Program was developed to assist local permitting agencies in identifying and reviewing the status of oil or gas wells. Before issuing building or grading permits, local agencies review and implement the DOGGR's preconstruction well requirements. Interaction between local permitting agencies and the DOGGR helps resolve land use issues and allows responsible development in oil and gas fields.

4.5.3.2 Local

Monterey County Zoning Ordinance

Title 16, Section 16.04 of the Monterey County Zoning Ordinance, entitled "Surface Mining and Reclamation," specifies zoning regulations and policies for mineral resource extraction. Specifically, the Monterey County Zoning Ordinance addresses mineral resource extraction land use classifications and mine reclamation.

16.04.010 Purpose and intent

Section 16.04.140 (B) "Purpose and Intent" states that the "the extraction of minerals is essential to the continued economic well-being of the County and to the needs of the society, and that the reclamation of mined lands is necessary to prevent or minimize adverse effects on the environment and to protect the public health and safety." In addition, "reclamation of mined lands will permit the continued mining of minerals and will provide for the protection and subsequent beneficial use of the mined and reclaimed land." The purpose and intent of the ordinance is to ensure the continued availability of important mineral resources, while regulating surface mining operations as required by California's Surface Mining and Reclamation Act of 1975 (Public Resources Code Sections 2710 et seq.), as amended, hereinafter referred to as "SMARA", Public Resources Code (PRC) Section 2207 (relating to annual reporting requirements), and State Mining and Geology Board regulations (hereinafter referred to as "State Regulations") for surface mining and reclamation practice (California Code of Regulations [CCR], Title 14, Division 2, Chapter 8, Subchapter 1, Sections 3500 et seq.), as those provisions may be amended, to ensure that:

- Adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses.
- The production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment.
- Residual hazards to the public health and safety are eliminated. (Ord. 4029, 1999; Ord. 2402 § 011, 1978)

16.04.140 Mineral resource protection

Specifically, Section 16.04.140 calls for mine development in areas compatible with mining operations, and designating such areas prior to encroachment from conflicting land uses. Mineral resource areas that have been classified by the State Department of Conservation's Division of Mines and Geology or designated by the State Mining and Geology Board, as well as existing surface mining operations, shall be protected from intrusion by incompatible land uses that may impede or preclude mineral extraction or processing.

In addition, Section 16.04.140 states that the County General Plan and resource maps shall be updated to reflect mineral information (classification and/or designation reports) within twelve (12) months of receipt from the State Mining and Geology Board of such information. Land use decisions within the County would be guided by information provided on the location of identified mineral resources of regional significance. Conservation and potential development of identified mineral resource areas will be considered and encouraged. Recordation on property titles of the presence of important mineral resource areas may be encouraged as a condition of approval of any development project in the impacted area. Prior to approving a use that would otherwise be incompatible with mineral resource protection, conditions of approval may be applied to encroaching development projects to minimize potential conflicts. (Ord. 4029, 1999)

4.5.4 Project Impacts

4.5.4.1 Thresholds of Significance

The impact assessment for Mineral Resources relies on the significance criteria in the CEQA Checklist presented in Appendix G of the CEQA guidelines. The 2007 General Plan would result in a significant impact on mineral resources if it would:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state;
- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

The above thresholds of significance are closely related, and are therefore combined for the purposes of the following impact assessment.

In addition, as described under "*Abandoned Mines*," pollution and water quality impacts from abandoned mines in Monterey County are beyond the scope of required CEQA analysis for mineral resources and are not addressed further in this section.

4.5.4.2 Impact Analysis

Loss of Availability of Known Mineral Resources

Impact MIN-1: Implementation of the 2007 General Plan would potentially result in the loss of availability of known mineral resources of value to the region and the residents of the state. (Less-Than-Significant-Impact.)

Impact MIN-2: Implementation of the 2007 General Plan would potentially result in the loss of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. (Less-Than-Significant-Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan to the 2030 planning horizon would result in new urban development in some undeveloped areas of the County. Policies identified in the 2007 General Plan require the identification and conservation of areas with significant mineral resources, as well as the development of new mining activities where environmental

impacts and land use conflicts would be avoided. In addition, the 2007 General Plan emphasizes compact city-centered growth in and near existing urbanized areas. This land use concept is designed to preserve significant undeveloped areas and minimize encroachment into mineral resource extraction areas.

2007 General Plan Policies

The 2007 General Plan and Area Plan policies summarized below establish comprehensive measures to avoid the loss of known mineral resources of value to the region and the residents of the state.

Conservation and Open Space Element

Policies in the 2007 General Plan Conservation and Open Space Element address the conservation of mineral resources. Conservation and Open Space Element Policy OS-2.1 (Protection of mineral resources sites) states that potentially significant mineral deposits and existing mining operations identified through the State Division of Mines and Geology, including idle and reserve properties, shall be protected from on-site and off-site land uses that would be incompatible with mineral extraction activities.

Conservation and Open Space Element Policy OS-2.2 (SMARA requirements) requires mineral extraction operations to adhere to sound conservation practices consistent with SMARA and other applicable standards. Adequate financial security shall be required to insure reclamation of the extraction site to a condition consistent with the surrounding natural landscape and environmental setting.

Conservation and Open Space Element Policy OS-2.3 (Recycling) supports efforts to conserve raw mineral resources through recycling.

Conservation and Open Space Element Policy OS-2.4 (Mapping) incorporates the use of GIS mapping to maintain up-to-date records on the locations of valuable mineral deposits in the county.

Conservation and Open Space Element Policy OS-2.5 (Abandoned mines) requires the county to inventory, assess, and characterize the location and condition of identified pre-SMARA abandoned gold, mercury and coal mines and implement such measures as may be necessary to ensure that such mines do not contribute to a significant risk to public health or safety or non-compliance with water quality standards and criteria.

The 2007 General Plan Conservation and Open Space Element establishes goals and corresponding policies to provide for the conservation, utilization and development of the County's mineral resources (Monterey County 2007). The policies provide for the

protection of mineral resources by supporting the careful placement of land uses that would be compatible with protection of these mineral resources. In addition, the policies support the updating of mapping information for accurate identification of existing known mineral resources within the county. Therefore, implementation of the policies outlined in the Conservation and Open Space Element of the 2007 General Plan would avoid the loss of known mineral resources of value to the region and the residents of the state.

Area Plan Policies

North County Area Plan

The North County Area Plan does not contain any land use compatibility policies related to the development of mineral resource sites or the protection of mineral resource sites. However, as shown on Exhibit 4.5.1, portions of the North County Area Plan within the Pajaro Valley are designated MRZ-1 by the State Geologist. Lands designated MRZ-1 are areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists of their presence. Therefore, implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the North County Area Plan because there are no known mineral resources of value designated by the State Geologist in this area.

In addition, the North County General Plan Land Use Map (Exhibit 3.1a) depicts two existing sites designated as Mineral Extraction. These sites would remain under this designation with implementation of the 2007 General Plan. Therefore, there would be no loss of availability of a locally-important mineral resource site delineated on a local land use plan.

Greater Salinas Area Plan

The Greater Salinas Area Plan does not contain any land use compatibility policies related to the development of mineral resource sites or the protection of mineral resource sites. However, as shown on Exhibit 4.5.1, portions of the Greater Salinas Area Plan are designated MRZ-1 by the State Geologist. Lands designated MRZ-1 are areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists of their presence. Therefore, implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the Greater Salinas Area Plan because there are no known mineral resources of value designated by the State Geologist in this area.

Central Salinas Valley Area Plan

The Central Salinas Area Plan does not contain any land use compatibility policies related to the development of mineral resource sites or the protection of mineral resource sites. In addition, as shown on Exhibit 4.5.1, there are no lands within the Central Salinas Valley Area Plan that are designated or mapped by the State Geologist. Therefore, implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the Central Salinas Valley Area Plan because there are no known mineral resources of value designated by the State Geologist in this area.

As shown on Exhibit 4.5.1, numerous oil wells are present within the Central Salinas Valley Area Plan on the westside of the valley in the between Greenfield and King City. The Central Salinas Valley Area Plan does not contain any specific land use compatibility policies related to oil field sites, or their protection. However, these oil wells are located in areas predominantly under agricultural production or grazing. Agriculture is generally compatible with oil and gas production, and continued agriculture production or grazing in these areas is not expected to impact oil production. Therefore, implementation of the Central Salinas Valley Area Plan is not expected to adversely affect the continued operation of these existing oil wells, or any future oil wells, due to the current and projected global demand for oil.

Greater Monterey Peninsula Area Plan

The Greater Monterey Peninsula Area Plan does not contain any land use compatibility policies related to the development of mineral resource sites or the protection of mineral resource sites. However, as shown on Exhibit 4.5.1, portions of the Greater Monterey Peninsula Plan are designated MRZ-1, 2, 3 and 4 by the State Geologist. The areas designated MRZ-2 include the incorporated cities of Sand City, Seaside and Marina which are located outside of the County's jurisdiction. The MRZ-3 designation applies to lands containing mineral deposits, the significance of which is undetermined and cannot be evaluated. The areas designated MRZ-3 include the incorporated cities of Monterey, Pacific Grove and Carmel-By-The-Sea which are located outside of the County's jurisdiction. The MRZ-4 designation applies to areas where available information is inadequate for assignment to any other zone (i.e., where there is not enough information available to determine the presence or absence of mineral deposits). The areas designated MRZ-4 include areas on the outskirts of Monterey and Del Rey Oaks.

Implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the Greater Monterey Peninsula Area Plan because the areas designated MRZ-2 (the lands containing known mineral deposits) are located in areas that are not under the County's jurisdiction. In addition, the State's Guidelines for Classification and Designation of Mineral Lands applicable to MRZ-2 zones identifies multiple exclusions to the MRZ-2 designation, including residential areas, commercial areas with land improvements, industrial areas, and major public and private engineering works (California Geological Survey 1999). Therefore, many of the urbanized and developed areas currently designated MRZ-2 are actually exempt.

Carmel Valley Master Plan

There are no lands within the Carmel Valley Master Plan that are designated or mapped by the State Geologist. However, Carmel Valley Master Plan Policy CV-1.19 (mines and quarries) encourages land use compatibility with mineral extraction activities by requiring visual screening, safe vehicular access, and noise reduction practices. In addition, policy CV-1.19 allows for development on slopes over 30% within the limits of the quarry.

Therefore, implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the Carmel Valley Master Plan because there are no known mineral resources of value designated by the State Geologist in this area. In addition, implementation of Carmel Valley Master Plan Policy CV-1.19 would ensure land use compatibility between proposed mineral resource extraction sites and existing land uses.

Toro Area Plan

The Toro Area Plan does not contain any land use compatibility policies related to the development of mineral resource sites or the protection of mineral resource sites. In addition, as shown on Exhibit 4.5.1, there are no lands within the Toro Area Plan designated or mapped by the State Geologist. Therefore, implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the Toro Area Plan because there are no known mineral resources of value designated by the State Geologist in this area.

In addition, the Toro Area Plan Land Use Map (Exhibit 3.10) depicts one existing site designated as Mineral Extraction. This site would remain under this designation with implementation of the 2007 General Plan. Therefore, there would be no loss of availability of a locally-important mineral resource site delineated on a local land use plan.

Cachagua Area Plan

There are no lands within the Cachagua Area Plan designated or mapped by the State Geologist. However, Cachagua Area Plan Policy CACH-3.5 (mining/timber operations) requires that future mining or other resource production operations include visual screening and safe vehicular access. In addition, proposed new mining operations must consider impacts on roadways from truck traffic, noise impacts, drainage impacts and mitigate for impacts to watersheds, flora and fauna. Reclamation plans are also required per SMARA requirements and Zoning Ordinance requirements.

Implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the Cachagua Area Plan because there are no known mineral resources of value designated by the State Geologist in this area. In addition, implementation of Cachagua Area Plan Policy CACH-3.5 would ensure land use compatibility between proposed mineral resource extraction sites and existing land uses.

South County Area Plan

The South County Area Plan does not contain any land use compatibility policies related to the development of mineral resource sites or the protection of mineral resource sites. In addition, as shown on Exhibit 4.5.1, there are no lands within the South County Area Plan are designated or mapped by the State Geologist.

Therefore, implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the South County Area Plan because there are no known mineral resources of value designated by the State Geologist in this area.

The South County General Plan Land Use Map (Exhibit 3.12) depicts several existing sites designated as Mineral Extraction sites, including the San Ardo oil fields. These sites would remain under this designation with implementation of the 2007 General Plan. Therefore, there would be no loss of availability of a locally-important mineral resource site delineated on a local land use plan.

As shown on Exhibit 4.5.1, numerous oil wells are present within the South County Area Plan centered around the San Ardo Oil Fields. The South County Area Plan does not contain any specific land use compatibility policies related to oil field sites, or their protection. Therefore, implementation of the South County Area Plan is not expected to adversely affect the continued operation of these existing oil wells, or any future oil wells, due to the current and projected global demand for oil.

Agricultural Winery Corridor Plan

The AWCP does not contain any land use compatibility policies related to the development of mineral resource sites or the protection of mineral resource sites. In addition, as shown on Exhibit 4.5.1, there are no lands within the South County Area Plan designated or mapped by the State Geologist.

Therefore, implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the AWCP because there are no known mineral resources of value designated by the State Geologist in this area.

As shown on Exhibit 4.5.1, numerous oil wells are present within the AWCP throughout the Jolon Road corridor, as well as the River Road/Arroyo Seco/Central Avenue corridor. The AWCP does not contain any specific land use compatibility policies related to oil field sites, or their protection. However, implementation of the AWCP is not expected to adversely affect the continued operation of these existing oil wells, or any future oil wells, due to the current and projected global demand for oil.

Community Area Policies

Fort Ord Master Plan—Conservation Element

As shown in Exhibit 4.5.1, a small area in the southwest portion of the Fort Ord Master Plan is designated MRZ-2 by the State Geologist. The MRZ-2 designation applies to areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists of their presence. Another small, adjacent area is designated MRZ-4, or as an area where available information is inadequate for assignment to any other zone.

In addition, there are many land use compatibility policies related to the development of mineral resource sites or the protection of mineral resource sites in the Fort Ord Master Plan Conservation Element. Objective B of the Conservation Element provides for mineral extraction and reclamation activities that are consistent with the surrounding natural landscape, proposed future land uses, and soil conservation practices.

Soils and Geology Policy B-1 (mineral resources classification) states the County shall identify areas of highly valuable mineral resources within the former Fort Ord area based on the State of California Division of Mines and Geology's mineral resources "classification-designation" system, and provide for the protection of these areas.

Soils and Geology Program B-1.1 (mineral resource designation) states that if the County determines that valuable mineral resources warranting protection are contained within the former Fort Ord, the County shall designate these areas in a mineral resource or similar land use category that would afford them protection. In addition, this area shall also be zoned in a district consistent with this designation.

Soils and Geology Program B-1.2 (property title) requires the County to record a notice identifying the presence of valuable mineral resources on property titles in the affected mineral resource protection areas.

Soils and Geology Policy B-2 (land use compatibility) states that the County shall protect designated mineral resource protection areas from incompatible land uses.

Soils and Geology Program B-2.1 (zoning compatibility) states that, if so provided, the County shall specify in its mineral resource protection-zoning district those uses that are deemed compatible with mining activities.

Soils and Geology Policy B-3 (reclamation plans) states that prior to granting permits for operation, the County shall require that mining and reclamation plans be prepared for all proposed mineral extraction operations.

Soils and Geology Program B-3.1 (reclamation requirements) states that the County shall develop and make available a list of issues to be considered and mitigated in mining and reclamation plans, including but not limited to, the following: buffering, dust control, protection of water quality, noise impacts, access, waste disposal, security and reclamation.

Soils and Geology Policy B-4 (reclamation bonds) states that the County shall require the posting of bonds for new mining permits if it determines that such a measure is needed to guarantee the timely and faithful performance of mining and reclamation plans.

Implementation of the 2007 General Plan would not result in the loss of availability of known mineral resources within the Fort Ord Master Plan because the areas designated MRZ-2 and MRZ-3 by the State Geologist would be protected under Soils and Geology Program B-1.1. In addition, the State's Guidelines for Classification and Designation of Mineral Lands applicable to MRZ-2 zones identifies multiple exclusions to the MRZ-2 designation, including residential areas, commercial areas with land improvements, industrial areas, and major public and private engineering works (California Geological Survey 1999). Therefore, any portion of the residential or commercial developed areas currently designated

MRZ-2 with the Fort Ord Master Plan area are actually exempt. In addition, implementation of Fort Ord Master Plan policies listed above would ensure land use compatibility between proposed mineral resource extraction sites and existing land uses.

Significance Determination

Implementation of the 2007 General Plan policies through the 2030 planning horizon would not result in the loss of availability of a known mineral resource of value to the region or the residents of the state. In addition, the 2007 General Plan and Area Plan policies address the need to protect access to mineral resources in the County. This would be achieved through compliance with applicable laws that govern surface mining and reclamation and by implementing policies to assist in the proper placement of mining and quarry activities. In addition, many of the lands designated MRZ-2 by the State Geologist are not under the land use jurisdiction of the County. Therefore, impacts in this regard would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

The loss of availability of known mineral resources of value to the region or residents of the state from implementation of the 2007 General Plan would be less than significant, and no mitigation is required.

Buildout

Impact of Development with Policies

Buildout to 2092 under the 2007 General Plan would potentially result in adverse impacts to known mineral resources of value in the County. However, the 2007 General Plan and Area Plan policies set forth comprehensive measures to avoid and minimize adverse impacts related to the loss of mineral resources.

Implementation of the 2007 General Plan to the 2092 planning horizon would result in new urban development in some undeveloped areas of the County. The 2007 General Plan emphasizes compact city-centered growth in and near existing urbanized areas. This land use concept is designed to preserve significant undeveloped areas and minimize encroachment into mineral resource extraction areas. In addition, policies identified in the 2007 General Plan require the identification and conservation of areas with significant mineral resources, as well as the development of new mining activities where environmental impacts and land use conflicts would be avoided.

2007 General Plan Policies

Implementation of the 2007 General Plan policies listed above under the 2030 Planning Horizon would expressly avoid the loss of availability of known mineral resource areas in the County through the 2092 planning horizon.

Significance Determination

Implementation of the 2007 General Plan policies through the 2092 planning horizon would not result in the loss of availability of a known mineral resource of value to the region or the residents of the state. Implementation of the 2007 General Plan policies addresses the need to preserve and conserve access to mineral resources in the county. This would be achieved through compliance with applicable laws that govern surface mining and reclamation and by implementing policies to assist in the proper placement of mining and quarry activities. In addition, many of the lands designated MRZ-2 by the State Geologist are not under the land use jurisdiction of the County. Therefore, impacts in this regard would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

The loss of availability of known mineral resources of value to the region or residents of the state from implementation of the 2007 General Plan through the 2092 planning horizon would be less than significant, and no mitigation is required.

4.5.4.3 Level of Significance after Mitigation

All impacts to mineral resources would be less than significant with implementation the 2007 General Plan, and no additional mitigation would be required.

4.6 Transportation

4.6.1 Abstract

There are about 1,250 miles of County roads in the unincorporated portion of Monterey County, consisting mostly 2-lane and some 4-lane roads that range from Principal Arterials to Local Roads. Tourism is a source of traffic that contributes substantially to County roads, along with commuter traffic, agricultural product and freight movement, intra-regional travel, and inter-regional travel (through-traffic). The county's leading industry, production and shipping of agricultural products, generates high volumes of traffic throughout the county, another major source of circulation system demands. Movement of goods in Monterey County is one of the primary functions of the transportation system and an essential component of the County's economy. Monterey County is served by four public airports, Monterey Peninsula Airport, Salinas Municipal Airport, Marina Municipal Airport, and Mesa Del Rey Airport (King City).

The County of Monterey, the Transportation Agency of Monterey County (TAMC), the California Department of Transportation (Caltrans), and Monterey-Salinas Transit (MST) are the four agencies responsible for overseeing the transportation needs in Monterey County. These agencies have separate, but sometimes overlapping responsibilities, ranging from maintaining roadway facilities, long-range planning of new and expanded facilities, and providing public transportation. As of 2008, 90 regional and local roadway segments in the County fell below the Level of Service (LOS) standards established in the General Plan or Area Plans.

Implementation of the 2007 General Plan to the 2030 planning horizon and beyond to 2092 would result in significant impacts on transportation infrastructure at three (3) levels:

- **Project-specific Access and Level of Service Impacts on County and Local Roadways—**New vehicle trips generated by growth anticipated under the 2007 General Plan in 2030 and at buildout would result in deficient roadway performance on County roadways and local streets, requiring project-specific environmental assessment. Mitigation is proposed that would reduce the individual impacts of new development to a less than significant level. As described below, cumulative impacts would be significant and unavoidable nonetheless.
- **Cumulative Level of Service Impacts on County Roadways—**New trips generated by growth contemplated by the 2007 General Plan in 2030 and at buildout, along with new trips generated by planned growth in Cities, would cumulatively result in deficient roadway performance on County roadways. Mitigation is proposed that would minimize the impact; of individual projects, however, this impact would remain significant and unavoidable after mitigation.

- **Cumulative Level of Service Impacts on Regional Roadways—**New trips generated by growth contemplated by the 2007 General Plan in 2030 and at buildout, along with new trips generated by planned growth in cities, would cumulatively result in deficient roadway performance on regional roadways (i.e., state and federal highways and major streets within incorporated cities). This also includes regional roads external to Monterey County. Mitigation is proposed that would minimize the impact; however, this impact would remain significant and unavoidable after mitigation.
- **Level of Service Impacts on Roadway Segments within the Winery Corridor—**New trips generated by agricultural and winery growth contemplated by the 2007 General Plan in 2030 and at buildout would result in deficient roadway performance on four roadway segments. Mitigation is proposed that would minimize the impact; however, this impact would remain significant and unavoidable after mitigation.

All other impacts would be less than significant and do not require mitigation.

4.6.2 Existing Conditions

4.6.2.1 Introduction

Monterey County's transportation system has two primary functions:

1. Facilitate mobility and access, for residents, workers and visitors, to community services, the work place, commercial centers, recreation areas and the variety of land uses throughout the County, and
2. Facilitate the transport of goods to, from, and within the County.

The transportation system in Monterey County consists of several components:

- Regional Highways such as; U.S. Route 101 and the State Highways 1, 25, 68, 146, 156, 183, 198, 218;
- Major County Roads such as; Carmel Valley Road, San Miguel Canyon Road, Jolon Road, Blanco Road, Metz Road, River Road, Arroyo Seco Road;
- Arterial and Local Roads, such as; Corral de Tierra Road, Boronda Road, Strawberry Road, Castroville Boulevard, Espinosa Road;
- Regional transit; principally the Monterey-Salinas Transit service;
- Rail services, including; Amtrak (passenger service), future CalTrain (passenger service), and the Union Pacific Railroad (freight);
- Regional and local bike routes, such as; the Monterey Bay Recreational Trail;
- Regional and local pedestrian and hiking trails; mostly found in state and regional parks;

- Public airports, including; Monterey Peninsula Airport, Salinas Municipal Airport, Mesa Del Rey Airport (King City), Marina Municipal Airport;
- Public Harbors, such as Monterey Harbor and Moss Landing.

4.6.2.2 Road and Highway Transportation

There are about 1,250 miles of County roads in the unincorporated portion of Monterey County (**Exhibit 4.6.2**) consisting mostly 2-lane and some 4-lane roads that range from Principal Arterials to Local Roads. Most of these roads were developed to serve agricultural areas, rural communities, or remote wilderness areas in the more mountainous regions of the County. Over the past decades, these roads have shifted from accommodating primarily rural levels of traffic to accommodating urban levels of traffic and commuter traffic, contrary to their originally intended use and design capacities. Consequently, a number of roads function at a below established acceptable levels of service. The same is true of many segments along the nine (9) State Highways that cross the County.

4.6.2.3 Tourism Traffic

Tourism is a source of traffic that contributes substantially to county roads, along with commuter traffic, agricultural product and freight movement, intra-regional travel, and inter-regional travel (through-traffic). An estimated eight million tourists visit Monterey County each year (Source: Monterey County Herald, 4/26/07). Almost all of these tourists traveled by automobile. Of the County's 11,192 hotel and motel rooms, 9,320 are in the Greater Monterey Peninsula area (excluding Big Sur).

Tourism is the county's second largest industry, and the continued expansion of the tourism industry in Monterey County will further exacerbate this source of impact. Present alternatives to the automobile are not attractive to casual weekend travelers or to long-distance tourists. Although visitors comprise a high percentage of commercial airline passengers arriving at Monterey Peninsula Airport (62 percent, according to a 1996 AMBAG study), the relatively low number of airline trips in and out of the Peninsula accounts for only a very small percentage of the annual tourist volume. Monterey Salinas Transit's popular Waterfront Area Visitor Express (WAVE) service is an example of a non-impact transportation mode specifically tailored to tourist demand. However, the increasing demand for access to Monterey County's relatively inaccessible areas such as the Big Sur coastline, along with the over-capacity conditions already in place as a result of resident and commuter traffic, warrants additional measures to facilitate other modes of tourist-oriented transportation.

4.6.2.4 Agricultural Traffic

As the County's leading industry, the production and shipping of agricultural products generates high volumes of traffic throughout the County. This is another major source of circulation system demands. There are two components to this traffic source:

Trucks

A high percentage of local agricultural production is fresh fruits and vegetables, which require speedy transport either directly to wholesalers from the fields or from the field to the processing plant, then to market. Trucks are therefore ever-present on rural roads and moving in and out of towns and cities and contribute to over-capacity conditions. Because of their size and limited maneuverability compared to cars, trucks consume more capacity and demand greater access when entering roads from loading sites or other roads. Their greater weight (up to 40 tons) exerts significant wear and tear on roads, accelerating the need for road repair.

Workers

Agricultural fields are located from the upper limits of northern Monterey County through the Salinas Valley to the southern part of the County (approximately 150 miles). Work is seasonal and crops are regularly rotated creating a moving work place for the workers. As a result, workers in the fields commute from where housing is available, which is generally within the cities. Although buses may be offered for transportation and workers/families may carpool, it is common for there to be a number of individual cars parked in a field that is being harvested.

4.6.2.5 Freight Movement

Movement of goods in Monterey County is one of the primary functions of the transportation system and an essential component of the County's economy. Most goods, particularly agricultural goods and quarried materials, are transported by truck. The Regional Freight Study prepared by the Association of Monterey Bay Area Governments (AMBAG) in 1995 states that Monterey County was generating about 10,800 truck trips per day at that time. AMBAG's study also projected that the County would generate about 12,800 truck trips per day in 2006. The Regional Freight Study indicates that truck traffic accounted for about 11 percent of the total annual travel in Monterey County. Truck traffic is expected to increase as overall traffic volumes increase throughout the County and the State. The Regional Freight Study by AMBAG forecasts a two (2) percent annual increase in truck traffic in Monterey County through 2015.

The four highways that carry the highest level of truck traffic are Highways 1, 101, 156, and 183. AMBAG estimates that truck traffic is utilizing about 5 to 10 percent of the capacity of these highways. Table 4.6-1 shows the average daily truck volumes on these primary truck routes in Monterey County, as well as the less utilized Highway 198.

Table 4.6-1. Average Daily Truck Traffic on Monterey County Highways

Highway	Average Daily Truck Traffic
Highway 1	up to 3,800
U.S. 101	2,800–12,600
Highway 156	2,300–2,500
Highway 183	1,900–3,300
Highway 198	75–150

Source: 2006 Annual Average Daily Truck Volumes on the California State Highway System, Caltrans.

4.6.2.6 Monterey County Travel Patterns

According to the 2000 Census "journey to work" statistics, Monterey County's employed residents primarily commute to work using automobiles, with a substantial proportion driving alone (68 percent), as shown in Table 4.6-2. Carpooling is relatively high at nearly 20 percent of commuters. The third highest mode of travel is walking, at just over 5 percent. All other modes of travel, including public transportation for commuting, equal less than 5 percent.

Part of the reason for this pattern can be attributed to the manner in which the County has developed. All of the valley cities are surrounded by prime agricultural lands and the 1982 General Plan was designed to focus development towards cities in order to retain agriculture as well as to preserve scenic hillsides. As a result, people must commute from population centers to places where there are goods, services, and/or jobs.

Table 4.6-2. Existing Commute Travel Modes

Mode of Travel	Percent of Commuters
Total Car, Van, or Truck	86.1
Drove Alone	68.3
Carpooled	17.8
Public Transportation	3.0
Walk	5.1
Other	1.2
Work at Home	4.6

Source: United States Census Bureau, 2006 American Community Survey.

4.6.2.7 Road and Highway Capacities

The County's circulation system has a finite carrying capacity, and in some areas, the system's capacity has been exceeded. Traffic conditions for any given road segment can be expressed by a simple formula as the ratio of the volume of traffic using the road to the volume the road segment was designed to accommodate; also known as its volume-to-capacity ratio. Both figures are expressed in terms of Average Daily Traffic Volumes (ADT), that is, the total number of vehicles using the road on an average day. The number of vehicles using the road is either measured (by automated or manual traffic counters) or modeled with a computer-based traffic model. The design capacity is based on engineering standards established by the 2000 Highway Capacity Manual (2000 HCM) and adopted by the County, cities, and Caltrans.

The volume-to-capacity ratio is used as a quantitative measure of the roadway LOS. LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or at an intersection during a specific time interval, and is meant to reflect the degree to which traffic on the road is subject to congestion-related delays. The LOS categories and their pairing with specific ranges of volume-to-capacity ratio are a matter of convention, derived from standards developed by traffic engineers. LOS ranges from LOS A, which is very little delay to LOS F representing long delays and congestion. Table 4.6-3 defines each LOS category that has been adopted by the County as matter of policy and is used by the Public Works Department and Caltrans to identify substandard conditions. The County's current standard for road performance is LOS C under the 1982 General Plan and is proposed to be LOS D under the 2007 General Plan.

Table 4.6-3. Level of Service Definitions

Level of Service	Description
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream.
B	Stable traffic. Traffic flows smoothly with few delays.
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours.
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.

Source: Transportation Research Board, Highway Capacity Manual 2000, National Research Council, 2000.

When the volume of daily traffic on a roadway exceeds its design capacity, the road is said to be over-capacity. An over-capacity roadway can be restored to capacity by one of two methods:

- Reduction in traffic volumes—A reduction in volume is usually achieved by building another road to which traffic will be diverted. This is not actually a reduction, but a redistribution of traffic volumes. Reductions in traffic volume are rarely proposed as a means to address over-capacity roadway conditions.
- Increase in road capacity—An increase in road capacity is usually achieved through road widening. Over-capacity conditions are usually addressed by a proposed addition of new lanes or by construction of new roadways.

Road construction and expansion are most often selected and favored by policy in Monterey County. Although this is a common response that reflects conventional policies, it also reflects the inherent difficulty of implementing "demand management" measures to reduce volumes after traffic has already been generated. Demand management is most effective in preventing increased traffic volumes by precluding the need for trips through a combination of prudent land use planning and highly convenient transit services. Policies in the 2007 General Plan are designed to address this issue.

As in any system that has reached or is reaching capacity, competing interests have begun to vie for limited space on local and regional roads. Trucks crowd the downtown streets of Castroville and South Salinas. Tourist traffic jockeys with commuters on Highway 68 and 156. Long distance commuters in North County share country roads with locals driving to the market. Increasing numbers of all these road users result in impacts that run contrary to the historic rural character of Monterey County's unincorporated towns and heartland. Exhibit 4.6.2 depicts the LOS on the County roadway system. Table 4.6.-4 lists the County roadways that currently operated below acceptable levels of service at LOS E and LOS F. There are 14 segments operating at LOS E and 70 segments operating at LOS F.

Table 4.6-4. Roadways Exceeding Level of Service Standard (Year 2008)

Roadway	Segment
State Roadway Segments Operating at LOS E based on Daily Capacity	
U.S. 101	Crazy Horse Canyon Rd to San Miguel Canyon Rd
SR-1	Rio Road to Carmel Valley Road
County Roadway Segments Operating at LOS E based on Daily Capacity	
San Juan Rd (G-11)	Salinas Rd to San Miguel Canyon Rd
San Juan Rd (G-11)	Aromas Rd to Carpenteria Rd
Abbott St	U.S. 101 to Salinas City Line
Carpenter St	Carmel City Line to Serra Ave

Roadway	Segment
Davis Rd	Blanco Rd to Reservation Rd
Espinosa Rd	SR-183 to US-101
Harris Rd	Spreckels Blvd to Abbott St
Porter Dr	Salinas Rd to San Juan Rd
Salinas Rd	SR-1 to Fruitland Ave
Other Regional Roadway Segments Operating at LOS E based on Daily Capacity	
N Fremont St	Casa Verde Wy to SR-218
Sanborn Rd	U.S. 101 to Abbott St
State Roadway Segments Operating at LOS F based on Daily Capacity	
U.S. 101	The Monterey / San Benito County border to Crazy Horse Canyon Rd
U.S. 101	San Miguel Canyon Rd to John St (8 segments)
SR-1	Salinas Rd to SR-183 (4 segments)
SR-1	Fremont Blvd to Del Monte Ave (2 segments)
SR-1	N Fremont St to Aguajito Rd
SR-1	Holman Hwy to Carpenter St
SR-1	Ocean Ave to Carmel Valley Road
SR-68 (Holman Hwy)	Forest Ave to SR-1 (4 segments)
SR-68 (Monterey-Salinas Highway)	SR-1 to Portola Dr (6 segments)
SR-156	Castroville Blvd to US-101
SR-183	SR-156 to Cooper Rd (3 segments)
SR-218	Fremont Blvd to SR-68 (2 segments)
County Roadway Segments Operating at LOS F based on Daily Capacity	
Salinas Rd (G-12)	Porter Dr to Railroad Ave
Elkhorn Rd (G-12)	Salinas Rd to Hall Rd
Hall Rd (G-12)	Elkhorn Rd to San Miguel Canyon Rd
San Miguel Canyon Rd (G-12)	Hall Rd to US-101 (3 segments)
Blanco Rd	Reservation Rd to Davis Rd (3 segments)
Carpenter St	Serra Ave to SR-1
Ocean Ave	Carmel City Line to Sr-1
Porter Dr	San Juan Rd to Santa Cruz County Line
Rio Rd	Carmel City Line to SR-1
San Juan Grade Rd	Salinas City Line to Russell Rd

Roadway	Segment
Other Regional Roadway Segments Operating at LOS F based on Daily Capacity	
Foam St	Prescott Ave to Lighthouse Ave (2 segments)
Lighthouse Ave	David Ave to Washington St (4 segments)
Del Monte Ave	Washington St to SR-1 (3 segments)
Fremont St	Abrego St to Camino Aguajito
Munras Ave/Abrego St	Soledad Dr to Via Zaragoza
Del Monte Blvd	SR-1 to Broadway Ave (2 segments)
Del Monte Blvd	SR-1 to Reservation Rd (2 segments)
John St	Abbott St to U.S. 101
Davis Rd	W Laurel Dr to W Blanco Rd (2 segments)

Source: Kimley-Horn & Associates, Inc. 2008.

In addition, the Area Plan for Carmel Valley specifies an acceptable LOS of "C" or "D" for Carmel Valley Road depending on the roadway segment (see Impact TRAN-2B for identification of segments and associated LOS standards), as opposed to a LOS "C" that is proposed to be the acceptable level for other Carmel Valley roadways and LOS D in the remainder of the unincorporated County. Integration of this analysis into the 2007 General Plan EIR allows for consistency between documents.

The roadway level of service analysis for the Carmel Valley Master Plan (CVMP) area is based on peak hour (AM and PM peak) information. The reason that CVMP roadway facilities are analyzed in the peak hour as opposed to the daily analysis used for the rest of the County is because the CVMP policies establish LOS standards based on peak hour (CV 2.18-d), and a recent draft traffic analysis of the CVMP and the Carmel Valley Transportation Improvement Program was available (CVMP Traffic Study, July 2007). Integration of this analysis into the 2007 General Plan EIR allows for consistency between documents.

The CVMP analysis of roadway segments is based on industry standard methods for peak hour analysis (2000 Highway Capacity Manual, Transportation Research Board). Two performance measures are used in the CVMP analysis; two-lane roadways are analyzed based on the percentage of time vehicles must travel in groups behind slower vehicles due to inability to pass, while four-lane roadways are analyzed based on the density of vehicles, or how closely vehicles travel together making it difficult to change lanes or pass. These performance measures reflect actual roadway operations and require detailed information about roadway configurations and peak hour travel characteristics.

In comparison, the performance measure used for the rest of the County is the ratio of daily traffic volume to daily roadway capacity, a theoretical planning

measure that estimates whether a roadway will experience peak hour congestion by comparing demand to the number of lanes available.

Table 4.6-5 presents existing roadway levels of service and identifies segments that are currently operating at LOS D or worse within the Carmel Valley Area Plan areas and are therefore deficient.

Table 4.6-5. Carmel Valley Roadway Level of Service (Year 2008)

		Level of Service	
Roadway	Direction	AM Peak	PM Peak
Highway (SR) 1			
Between Ocean Ave & Carpenter St	NB	C	C
	SB	C	C
Carmel Valley Road			
East of Holman	BOTH	A	A
Holman Road to Esquiline Road	BOTH	A	A
Esquiline Road to Ford Road	BOTH	C	B
Ford Road to Laureles Grade	BOTH	C	C
Laureles Grade to Robinson Canyon Road	BOTH	D	C
Robinson Canyon Road to Schulte Road	BOTH	D	D
Schulte Road to Rancho San Carlos Road	BOTH	D	D
Rancho San Carlos Road to Rio Road	EB	A	A
	WB	A	A
Rio Road to Carmel Rancho Boulevard	EB	A	B
	WB	B	B
Carmel Rancho Boulevard to Highway 1	EB	B	A
	WB	A	B

Source: Kimley-Horn & Associates, Inc. 2008 and DKS Associates, 2007

In addition to Monterey County roadways described above, the analysis includes regional roadways external to the County that might be impacted by growth allowed under the General Plan in Santa Cruz, San Benito, and San Luis Obispo Counties. Table 4.6-6 present the existing levels of service for regional roadways external to the county. These external regional roadways were selected because they either represent the extents of the AMBAG model network for which future traffic volumes can be projected.

4.6.2.8 Public Transit Services

The Monterey Salinas Transit (MST) system is an inter-city and intra-city bus service. MST serves a 275 square-mile area of Northern Monterey County and Southern Santa Cruz County providing intercity bus service between Monterey and Salinas, Marina and Watsonville, Salinas and Watsonville, and south from Salinas as far as King City. Inter-city service is provided in Gonzales, Marina, Monterey, Pacific Grove, Salinas, and Seaside. MST offers 37 routes that serve an estimated 352,000 people residing within three-quarters of a mile from established routes. These MST lines connect with Santa Cruz Metropolitan Transit District routes originating at the Watsonville Transit Center.

MST's rural service is provided to Carmel Valley and seasonally to Big Sur. The Waterfront Area Visitor Express (WAVE) offers locals and tourists service to popular tourist destinations within the City of Monterey.

MST RIDES, Monterey County's paratransit program, provides transportation service for individuals who have a disability that prevents them from using MST's regular fixed route transit services. The MST RIDES program also provides the RIDES Special Transportation (RIDES ST) service for persons living outside of the ADA-required service corridor (up to ¾-mile from any MST fixed route bus line).

MST RIDES serves 14 municipalities in two counties and 10 additional communities in the unincorporated areas of Monterey County. Service coverage spans the Monterey Peninsula, Carmel, Carmel Valley, Salinas, Chualar, Gonzales, Greenfield, Soledad, King City, and the Watsonville Transit Center. As of February 2006, there are 2,145 people certified as ADA Paratransit eligible within the service area. About half of that population resides either in Salinas or Monterey, approximately 38 percent in Salinas, and 13 percent in Monterey.

Table 4.6-6. Regional Roadway Level of Service External to Monterey County (Year 2008)

		Existing Conditions	
Roadway Segment		V/C Ratio	Level of Service
Santa Clara County			
US Highway 101	Cochrane Rd to E Dunne Ave	1.139	F
US Highway 101	Masten Ave to Leavesley Rd/SR-152 West	0.989	E
US Highway 101	Monterey Rd to SR-25	1.071	F
SR-152	SR-156 to Merced County	0.630	C

Roadway Segment		Existing Conditions	
		V/C Ratio	Level of Service
SR-1	Soquel Ave to 41st St	1.368	F
SR-1	Airport Blvd to SR-152	0.876	D
SR-1	Harkings Slough Rd to SR-129	0.608	C
SR-1	SR-129 to Monterey County	0.492	B
SR-17	Santa Clara County to Granite Creek Rd	0.958	E
SR-129 (Riverside Rd)	Lakeview Rd to Carlton Rd	0.847	D
San Benito County			
US Highway 101	Santa Clara County to SR-129	0.912	E
SR-25 (Bolsa Rd)	Santa Clara County to SR-156	1.196	F
SR-156	Salinas Rd to Union Rd	1.706	F
San Luis Obispo County			
US Highway 101	Monterey County to San Miguel Ave	0.300	A

Source: Kimley-Horn and Associates, Inc.

The MST RIDES ST service area includes the unincorporated areas of Prunedale, Castroville, and Aromas for North Monterey County as well as the area along River Road from State Highway 68 to, and including, Las Palmas Ranch II. The MST RIDES ST service area extends one mile on either side of Highway 101 from Salinas to Bradley including the unincorporated communities of San Lucas and San Ardo for South Monterey County. MST RIDES ST services are provided when MST RIDES and MST's regular bus services are in operation. Table 4.6-7 lists each MST bus route. Exhibit 4.6.3 shows MST bus routes in Monterey County.

Table 4.6-7. Monterey Salinas Transit Bus Routes

Route No.	Route Area	Route No.	Route Area
1	Pacific Grove	29	Watsonville-Salinas
1x	Asilomar-Lovers Point Express	36	Laguna Seca-Carmel
2	Monterey-Pacific Grove	37	Laguna Seca-Seaside
2x	Pebble Beach Express	38	Laguna Seca-Monterey
4	Carmel-Carmel Rancho	39	Laguna Seca-Salinas
5	Monterey-Carmel	41	East Alisal-Northridge
6	Edgewater-Ryan Ranch	42	East Alisal-Westridge
7	Monterey-Carmel	43	Memorial Hospital
9	Fremont-Hilby	44	Northridge
10	Fremont-Ord Grove	45	East Market-Creekbridge
11	Edgewater-Carmel Express	46	Natividad
16	Monterey-Marina	48	Salinas-Airport Business Center
20	Monterey-Salinas	49	Northridge
21	Monterey-Salinas	55	Monterey-San Jose Express
22	Big Sur	56	Monterey-Memorial Hospital
23	Salinas-King City	No-route number - service available on demand	Monterey-Peninsula DART
23x	Salinas-King City Express		MST On Call Marina
24	Carmel Valley Grapevine Express		MST Trolley-Monterey
27	Watsonville-Marina		MST RIDES
28	Watsonville-Salinas		

Source: Monterey Salinas Transit. 2008.

4.6.2.9 Transportation

Civilian Aviation Facilities

Monterey County is served by four public airports, Monterey Peninsula Airport, Salinas Municipal Airport, Marina Municipal Airport, and Mesa Del Rey Airport (King City). The Monterey Peninsula Airport is owned and operated by the Monterey Peninsula Airport District. The Salinas Municipal, Marina Municipal (formerly Fritzsche Army Airfield), and Mesa Del Rey (King City) Airports are owned and operated by their respective cities. Additional information on the four public airports is included in Table 4.6-8. Monterey County also contains over thirty private airstrips and agricultural landing fields.

Table 4.6-8. Monterey County Airports

Airport	Runways	General Aviation Aircraft Based at the Airport	Average Aircraft Operations
Monterey Peninsula Airport	2	165	250 per day with 60 scheduled commercial passenger flights
Salinas Municipal Airport	3	229	213 per day
Marina Municipal Airport	1	69	110 per day
Mesa Del Rey Airport	1	31	67 per week

Source: http://www.airnav.com/ 2008.

The Monterey Peninsula Airport District includes portions of Monterey, Pacific Grove, Del Monte Forest, Pebble Beach, Carmel-by-the-Sea, greater Carmel, Del Rey Oaks, Seaside, Sand City, the Monterey-Salinas Highway to Laureles Grade, and the west end of Carmel Valley. The Airport District is not incorporated into the City or the County, nor is it a public utility. According to the Monterey Peninsula Airport District, passenger and airport operations have been declining since it peak in 1978 (from 640,000 passengers annually to 340,000 in 2004).

A small airstrip had been located in the Carmel Valley Village area under the 1982 General Plan. This airstrip is no longer in operation and the property is under private ownership. A prior action by the Monterey County Board of Supervisors changed the land use designation so that this property is now consistent with the surrounding neighborhood. As such, the former airstrip property is designated for low-density residential uses under the 2007 General Plan.

Military Aviation Facilities

Military aviation facilities are located within the boundaries of Fort Hunter Liggett and Camp Roberts to the south.

The Schoonver Tactical Air Strip at Fort Hunter Liggett is a 5,000-foot compacted dirt and rock surface runway capable of supporting C-130 Hercules and C-12 Huron operations. In addition, Fort Hunter Liggett also contains the Doolittle Aircraft Training Area, which is used for Close Air Support training by Navy aircraft from Naval Air Station Lemoore in Kings County.

McMillan Airfield at Camp Roberts is a 3,500-foot long runway with a paved surface capable of supporting C-130 operations. McMillan Airfield is currently used for Unmanned Aerial Vehicle operations and testing.

4.6.2.10 Rail Transportation

Rail transportation historically played a key role in developing and supporting the land uses and major industries in Monterey County. Several of the cities and communities of the Salinas Valley (e.g., King City, Gonzales, Chualar, Soledad, San Ardo, San Lucas, and Bradley) owe their existence and early vitality to the development and economic benefits associated with the construction of the Southern Pacific Railroad through the County in the late 1800s. The agricultural industry of the valley flourished in partnership with the transport of produce by rail to the national market. The tourism industry, which has been the basis of Monterey Peninsula's economy for more than a century, was spurred originally by construction of Southern Pacific's new line in 1879 from Castroville to Monterey, with a special stop at Southern Pacific's own Del Monte Hotel.

Since the 1950s, the primary mode of travel for county residents and visitors alike has been the single-passenger automobile. The heavy flow of agricultural freight that once traveled by railway is now transported by trucks using local streets and the county's arterial roads and highways. The San Francisco to Monterey passenger rail service (the "Del Monte" trains) was discontinued in 1971 following a long period of declining ridership and downgrades in service.

Currently, the Union Pacific Railroad (which acquired the Southern Pacific in 1996) owns and operates most of the rail trackage in Monterey County. The Coast Line enters Monterey County in Aromas, heads west down the Pajaro Valley to Watsonville Junction (Pajaro), turns south, enters the Salinas Valley, and extends down the length of the Valley to the San Luis Obispo County line. Most of the Coast Line is single-tracked.

The Monterey Branch line from Castroville to Monterey passes through the Cities of Marina and Seaside and through Fort Ord and terminates at Cannery Row in Monterey. This 12.9-mile, single-track branch line is inactive and is owned by the TAMC. In several places in Seaside and Monterey, the tracks have been paved over to accommodate the Monterey Bay Coastal Trail, which runs between Marina and Pebble Beach.

Rail service today is limited to four (4) to six (6) freight trains per day running between Los Angeles and the San Francisco Bay Area. Amtrak's Coast Starlight, a passenger line, stops at Salinas once daily, in each direction, on its run between Seattle and Los Angeles. The nearest commuter rail stop to Monterey County is the Caltrain depot in Gilroy in Santa Clara County. Caltrain operates commuter rail service between Gilroy and San Francisco five (5) days a week during the morning and evening commute hours. Caltrain provides frequent daily service between San Jose and San Francisco.

Future Passenger Rail Service Plans

TAMC is planning to extend Caltrain service from Gilroy to Monterey County, including stops in Pajaro, Castroville, and Salinas. Information available on the TAMC website indicates that initial plans for service include up to four (4) weekday roundtrips between Salinas and San Francisco, with new intermediate stops at Pajaro and Castroville. The estimated cost of the extension of service is $101 million, with service beginning as early as 2011. The route is expected to generate an annual ridership of 530,000. The project is currently in the design and engineering stage.

To accommodate commuter rail service, track improvements would be made to the Coast Line between Gilroy and Salinas; stations would be built at Pajaro and Castroville; the existing train station in Salinas (also referred to as the "Intermodal Transportation Center") would be expanded; and a new layover facility would be constructed in Salinas. Under the preferred alternative, the Pajaro station would be located adjacent to Salinas Road and the Castroville station would be located north of Highway 156. Note that the County of Monterey adopted a Community Plan for Castroville in 2007 that envisions residential and commercial development on 145 acres around the proposed train station and includes elements designed to encourage rail ridership.

The Santa Cruz County Regional Transportation Commission is in the process of negotiating the acquisition of the Santa Cruz Branch line from Union Pacific Railroad, extending from Pajaro/Watsonville to Davenport (Santa Cruz County). The rail line may be used for passenger rail service. Future passenger rail service between Santa Cruz County and the San Francisco Bay Area may result in additional passenger rail service in Monterey County.

TAMC is also studying restoring service to the Monterey Branch line between Castroville and Monterey. These studies of Monterey Peninsula Fixed Guideway Service include sponsoring alternatives analysis, environmental studies, and right-of-way investigations. The route would connect the planned Caltrain service in Castroville to the Peninsula, with stations in Monterey, Seaside, Sand City, Marina/CSUMB, and Castroville. Options under consideration include bus rapid transit (BRT), light rail and express bus service. The project is currently under environmental review, with service anticipated to being in 2014.

Exhibit 4.6.4 depicts the various passenger rail service options in Monterey and surrounding counties being explored by various transportation agencies at the present time.

4.6.2.11 Water Transportation

There are two harbors in Monterey County; Monterey Harbor, and Moss Landing Harbor. Both harbors are classified as small craft harbors, serving commercial fishing vessels and pleasure craft. There are nearly 500 berths, 150 privately owned mooring buoys, and 39 seasonal, rental moorings in the Monterey Harbor.

Nearly 25 percent of the vessels in the Monterey Harbor have commercial uses. Moss Landing Harbor provides 620 berths. The demand for berths exceeds the supply, and waiting periods for berths vary based on the size of the vessel. The estimated waiting periods for small vessels range from three (3) to five (5) years; mid-size vessels, eight (8) to ten (10) years; and up to 15 years for large vessels.

4.6.2.12 Bicycle Transportation

There are approximately 240 miles of bikeways on state, county, and local roads within Monterey County. Caltrans maintains a majority of the bikeways, including the Pacific Coast Route, which is a 120-mile Class III bicycle route that follows the coastline. The remaining bicycle facilities are maintained by the Cities and County and are shown in **Table 4.6-9** by classification and distance.

Table 4.6-9. Bicycle Facilities in Monterey County

Facility Type	Miles of Facility	Description
Class I	27.6	Dedicated bicycle/pedestrian path
Class II	57.4	Striped bicycle lane
Class III	41.0	Signed bike route without lanes
Total	**126.0**	

Source: TAMC 2005 General Bikeways Plan.

Notes: Includes bike facilities in cities and unincorporated county areas.

The largest concentration of bicycle trips is in the northwestern region of the County, which has the highest population density. TAMC estimated 1,436 daily commuter bicycle trips were made by Monterey County residents in 2005. Exhibit 4.6.5 depicts the 2008 Transportation Agency for Monterey County Bicycle Map.

4.6.2.13 Regulatory Framework

California Department of Transportation (Caltrans)

Caltrans builds, operates, and maintains the State Highway system, including the Interstate Highway system. Caltrans' mission is to improve mobility statewide. The department operates under strategic goals to provide a safe transportation system, optimize throughput and ensure reliable travel times, improve the delivery of state highway projects, provide transportation choices, and improve and enhance the states investments and resources. Caltrans controls the planning of the state highway system and accessibility to the system. Caltrans establishes LOS goals for highways and works with local and regional agencies to assess impacts and develop funding sources for improvements to the State Highway system. Caltrans requires encroachment permits from agencies or new development before any construction work may be undertaken within the state's right-of-way. For projects that would impact traffic flow and levels of services on state highways, Caltrans would recommend measures to mitigate the traffic impacts.

Monterey County Public Works Department

The Monterey County Public Works Department is responsible for capital facility planning and maintaining roads, bridges and related facilities, as well as storm drains within the public right of way, sanitation district collection, treatment, and disposal facilities, County Service Area urban services, and County landfills, within the unincorporated area of the County. The department works with the County Planning Department to review land development applications for compliance with Local and State regulations (private roads, driveways and County maintained roads). The department administers encroachment permits for work performed within County rights of way, such as underground utility work, and driveways and road approaches; permits street closures; and issues transportation permits for County roads.

Transportation Agency for Monterey County (TAMC)

TAMC is an independent agency of local officials who oversee planning and funding of regional transportation improvements throughout Monterey County. The agency is directed by elected officials from each of the 12 incorporated cities in Monterey County and the County Supervisors. TAMC prepares the Regional Transportation Plan (RTP) and oversees the implementation of its recommended improvements. The RTP plans and programs local, state, and federal transportation funds for the development of transportation projects in Monterey County over a twenty-five year period conforming to State and Federal requirements. The RTP identifies existing and future transportation related needs, includes all modes of travel, and identifies realistic transportation improvements that would be implemented with anticipated available funding.

Association of Monterey Bay Area Governments

AMBAG was established to conduct planning and study of regional land use, transportation, and economic issues of concern to the Counties and Cities in Monterey, San Benito, and Santa Cruz Counties. Although AMBAG is not a regulatory agency, it prepares studies, plans, policy and action recommendations that may be incorporated into regulatory documents. AMBAG is represented by locally elected officials appointed by their respective City Council or Board of Supervisors. In addition to its transportation planning and study functions, and policy recommendations, AMBAG develops and maintains a regional travel demand forecasting model used for the planning of regional transportation facilities and the assessment of development proposals.

Local Agencies

The incorporated Cities of Salinas, Monterey, Carmel, Del Rey Oaks, Gonzales, Greenfield, King City, Marina, Pacific Grove, Sand City, Seaside, and Soledad have each adopted their own General Plans, polices and/or capital improvement programs which regulate development and transportation improvements within their jurisdiction. However, transportation network and circulation related impacts produced by land use decisions transcend City-County boundaries, requiring coordination between Monterey County and local agencies departments related to land use planning and transportation improvements.

4.6.3 Project Impacts

This section describes the CEQA impact analysis relating to transportation for the Project and its alternatives. It describes the methods used to determine the Project's impacts and lists the thresholds used to conclude whether an impact would be significant or not. Measures to mitigate significant impacts accompany each impact discussion.

4.6.3.1 Methodology

Roadway level of service impacts of the 2007 General Plan on Monterey County, and regional roadways are evaluated for the following five analysis scenarios:

- Existing Conditions (Year 2008)
- Existing plus Project (Development to the year 2030)
- 2030 Cumulative Conditions (Cumulative and project development to the year 2030)
- Existing plus Project (Buildout of the General Plan in 2092)

- Buildout Cumulative Conditions (Cumulative and project development to the year 2092)

Each of the scenarios incorporates different land use and roadway network assumptions for Monterey County. These assumptions are described in the next section. For each scenario, projected daily roadway segment traffic volumes are used to calculate the roadway's level of service which are compared to the County's roadway level of service standard. The results are used to identify roadway segments that fail to meet County standards and significant impacts.

Roadway segment level of service is based on the performance measure of the ratio daily traffic volume to daily roadway capacity (V/C Ratio), a theoretical planning measure that estimates whether a roadway will experience peak hour congestion by comparing traffic demand to the number of lanes available. A ratio greater than 1.0 indicates that traffic demand would exceed theoretical capacity and traffic would become gridlocked. In actuality, roadways can accommodate more traffic than the theoretical daily capacity, but the V/C Ratio planning measure is a good indicator of expected peak hour traffic congestion.

This performance measure is a coarse planning tool, but one that is appropriate for a generalized long-range programmatic assessment such as this General Plan. This generalized planning tool is based on the 2000 Highway Capacity Manual and uses general default values. It is intended for broad applications such as statewide or countywide analyses, potential problem identification, and future year analyses. This level of analysis is typically conducted using daily traffic projections and tends to over-estimate traffic impacts.

At the project-specific or small planning area level of assessment, traffic analyses should conducted at the peak hour level, with more detailed and specific operational input to roadway and intersection characteristics (i.e., number of turning lanes, signal timing, etc.).

While the County's level of service (LOS) standard (LOS D) is applied to both peak hour and daily traffic conditions, daily traffic projections are used in the analysis of the 2007 General Plan because the regional transportation planning tool (the AMBAG Travel Demand Forecasting Model) was developed and validated for daily traffic conditions.

4.6.3.2 Analysis Scenarios

Table 4.6-10 summarizes the land use and transportation network assumptions used in each analysis scenario. Additional information describing the assumptions for each scenario and the methodology for developing projections are provided below. Table 4.6-11 compares the population, employment and housing unit projections analyzed in each of the scenarios. Population and

employment forecasts are divided into incorporated and unincorporated portions of the County[1].

Table 4.6-10. Summary of Land Use and Transportation Network Assumptions

Scenario	Unincorporated Land Use	Incorporated Land Use	Transportation Network
Existing (2008)	Existing Roadway Traffic Volumes		
Existing plus Project Buildout	Buildout of 2007 General Plan	2000 AMBAG Data (2004 version)	AMBAG 2000 Base Network Modified to 2008 [1]
Existing plus Project (2030)	Prorated Buildout of 2007 General Plan to 2030	2000 AMBAG Data (2004 version)	AMBAG 2000 Base Network Modified to 2008 [1]
Cumulative 2030	Prorated Buildout of 2007 General Plan to 2030	2030 AMBAG Projections (2004 version)	2008 Modified Network with proposed TAMC and County Projects
Cumulative Buildout	Buildout of 2007 General Plan	Projected Buildout based on 2030 AMBAG Model	2008 Modified Network with proposed TAMC and County Projects
Cumulative 2030 Prior Land Use (No Project)	2030 AMBAG Projections (2004 version)	2030 AMBAG Projections (2004 version)	2008 Modified Network with proposed TAMC and County Projects

[1] The AMBAG 2000 network represents the year 2000 baseline network for which the model was validated. To reflect 2008 conditions, the 2000 network was modified to reflect completed projects on County roads.

[1] To provide for an equivalent comparison, portions of the County that are currently unincorporated but are forecast to be annexed to cities prior to 2030 are included in the incorporated category for all scenarios.

Table 4.6-11. Population, Housing Unit and Employment Projections by Scenario

	Year 2000	Existing plus Project Buildout	Existing plus Project (2030)	Cumulative 2030	Cumulative Buildout
Countywide					
Housing Units	129,571	168,904	143,009	187,022	290,631
Population	401,499	509,692	437,665	602,790	937,373
Employment	222,471	304,388	253,060	335,362	520,531
Unincorporated					
Housing Units	35,252	74,585	48,690	48,690	74,585
Population	95,047	203,240	131,213	135,431	207,458
Employment	65,242	147,159	95,831	97,109	148,431
Incorporated					
Housing Units	94,319	94,319	94,319	138,332	216,046
Population	306,452	306,452	306,452	467,359	729,915
Employment	157,229	157,229	157,229	238,253	372,100

Notes: Year 2008 population, employment and housing unit data not available, Year 2000 data is shown for comparison.
Existing plus Project 2030 and Cumulative 2030 land uses were adjusted to match the published AMBAG 2004 Population, Employment and Housing Unit forecasts.

Existing Conditions

Existing conditions represents approximate 2008 roadway conditions. Traffic volumes were obtained from various sources, including Caltrans, the County and for those regional roadways within incorporated areas, local agencies. Volumes from 2002 and 2006 were obtained where available and adjusted, based on annual growth rates, to represent 2008 conditions.

Roadway classification was based on aerial photographs, the Transportation Research Board's 2000 Highway Capacity Manual (HCM) classification criteria, and field observations.

Existing plus Project (Development to the year 2030)

Existing plus Project Conditions represents development forecasted to occur in unincorporated areas of the County by the year 2030. It is a prorated portion of the forecast buildout of unincorporated areas (described below). The amount of total development in unincorporated areas assumed under this scenario matches the amount of development in unincorporated areas projected by the AMBAG 2004 forecast to the year 2030. Employment data for unincorporated portions of the County was obtained from the year 2030 AMBAG forecasts. Unincorporated

County population and employment forecasts in 2030 are from the currently approved AMBAG Travel Demand Forecasting Model (AMBAG Model)[2].

The AMBAG development projections prepared in 2004 (the currently adopted regional forecast) are conservative since AMBAG has recently developed, but not yet adopted, new growth projections (2008) that are significantly lower than their 2004 projections. However, since the new projections have not yet been adopted and the approved AMBAG model remains based on 2004 projections, the 2007 General Plan in 2030 remains consistent with AMBAG adopted population and employment forecasts.

No change to the base model land use was made within incorporated areas. The coastal areas (including Big Sur and the Del Monte Forest) do not include any growth as new development is not expected to occur in these areas.

This scenario utilizes the modified AMBAG base year roadway network reflecting 2008 conditions. No major improvement projects that would affect regional roadways have been constructed following the last revision to the model network. To develop 2030 traffic projections the percent annual growth on each roadway segment between the base model (year 2000) and the Existing plus Project (year 2030) scenario was applied to 2008 traffic volumes over 22 years reflecting growth from 2008 to 2030.

2030 Cumulative Conditions with Project (Cumulative and Project Development to the Year 2030)

2030 Cumulative Conditions represent forecast year 2030 conditions with implementation of the 2007 General Plan. Development in unincorporated portions of the County was determined by the methodology described in the Existing plus Project (Development to the year 2030) scenario described above. Development in incorporated portions of the County, and in adjacent counties including Santa Cruz, San Benito and parts of Santa Clara, was obtained directly from the Year 2030 AMBAG 2004 forecasts. The cumulative roadway level of service analysis includes key roadways external to Monterey County.

The roadway network in this scenario represents a conservative estimation of capital projects that would be constructed by the year 2030. These include the projects adopted in the Transportation Agency of Monterey County (TAMC) regional fee program, and the capacity enhancements proposed by the County to be included in the development of a Countywide traffic impact fee program, as specified in 2007 General Plan Policy C-1.8.

Table 4.6-12 describes the sixteen TAMC fee program projects. In addition to the regional roadways, the TAMC projects include capacity-enhancing projects on County roadways. Table 4.6-13 describes the capacity enhancing projects

[2] AMBAG Model developed using 2004 population and employment growth projections.

identified by the County in the development of a Countywide Traffic Impact Fee Program.

Table 4.6-12. TAMC Regional traffic Impact Fee Program Projects

SR 1 - Sand City / Seaside Widening	Highway 1 (Seaside – Sand City)	Widen Highway 1 to six lanes from Fremont Ave to at least Canyon Del Rey and make interchange and related local road improvements in the vicinity of Canyon Del Rey and Fremont Avenues.
SR 68 - CHOMP Widening	Between Highway 1 and Community Hospital of Monterey Peninsula	Widen Holman Highway 68 from CHOMP to Hwy 1 to 4 lanes and make operational improvements at the Hwy 68 – Hwy 1 interchange.
SR 156 Widening	North Monterey County from Castroville Blvd to the 156/101 Interchange	Widen existing highway to 4 lanes and upgrade highway to Freeway status with appropriate interchanges. Interchange modification at US 156 and 101.
Marina - Salinas Corridor	Between Marina and Salinas	Widen Davis Road to 4 lanes from W Blanco Rd to Reservation Road, Widen Reservation Road to 4 lanes from Davis Road to existing 4 lane section adjacent to East Garrison, Widen Imjin Parkway to 4 lanes from Reservation Road to Imjin Road, reconstruct 12th street (Imjin Parkway) interchange.
Del Monte - Lighthouse Corridor Improvements	City of Monterey	Add eastbound lane from El Estero to Sloat Ave. Intersection improvements to Sloat Ave and Aguajito Ave including addition of left turn lanes and signal operations improvements. Widen Lighthouse Ave to 3 lanes (2 lanes for traffic, 1 lane for transit) and convert to one-way heading east. Widen Foam St to 3 lanes from the Lighthouse split to Drake Ave. Widen Hoffman to 2 lanes between Foam and Lighthouse and make one-way from Foam towards Lighthouse. At David Ave/Lighthouse interchange, add double left-turn onto Lighthouse. Add curved return lane on west-side of Lighthouse/Foam split to allow traffic to flow back onto Foam.
US 101 - San Juan Road Interchange	Counties of Monterey and San Benito	Remove three at-grade intersections (Dunbarton Road, San Juan Road and Cole Road) and construct one interchange near the Red Barn.
US 101 - South County	US 101 north of Soledad	Construct 2-lane frontage roads on west-side of US-101 from Harris Rd/Abbott St interchange to Chualar. Remove existing segment of Abbott St from US-101 to Harris Rd. Additional 2-lane frontage rd on east side of US-101 from Chualar to Harris Rd. Construct an interchange at Chualar.

Westside Bypass	City of Salinas	Construct 4-lane westside bypass around Salinas from Boranda to Davis Rd, including 4-lane Rossi St connector. Includes widening of Davis to 4 lanes from bypass connection to W Blanco Rd.
SR 68 Commuter Improvements	Rte 68 between Monterey and Salinas	Widen SR 68 from existing 4 lane section adjacent to Toro park west to Corral De Tierra.
Harris Road / Eastside Connector	City of Salinas	Construct 4-lane arterial from US 101 to Williams Road and an interchange at Harris Rd / US 101.
G-12 South	Unincorporated Monterey County	Widen San Miguel Cyn Rd to four lanes from just south of Moro Rd through Castroville Blvd. Add climbing lane on southbound San Miguel Cyn Rd just north of Strawberry Rd. Add two-way left-turn lane on San Miguel Cyn Rd between Castroville Blvd and Echo Valley Rd. Add a traffic signal at Echo Valley Rd.
G-12 North	Unincorporated Monterey County	Add a two-way left-turn lane on Hall Rd between San Miguel Cyn Rd and Elkhorn Rd. Widen Elkhorn Rd to four lanes from Hall Rd to Werner Rd.
Gloria Rd / US 101 Interchange	Gonzales	Re-align and reconstruct the Gloria Road / US 101 interchange. A Project Study Report is currently underway.
US-101/South Soledad Interchange & US-101/North Soledad Interchange	South Soledad/North Soledad	Modify South Soledad interchange and construct related ramp improvements to accommodate future widening of US-101 to six lanes as well as the planned SR-146 Bypass from Front Street to Metz Road. Modify North Soledad interchange and construct related ramp improvements to accommodate future widening of US-101.
Walnut Ave / US 101 Interchange	Greenfield	Relocate and replace the existing Walnut Avenue / US 101 interchange. Cost estimate assumes selection of Alternative 3 from the Project Study Report currently being prepared.
First Street / US 101 Interchange	King City	Extension and grade separation over railroad tracks of San Antonio Drive (King City loop road) from Lonoak Road to interchange of First Street and US 101.

Source: Regional Impact Fee Nexus Study Report, Kimley-Horn and Associates, Inc.

Table 4.6-13. Countywide Capacity Enhancements Proposed in Countywide Traffic Impact Fee Program

San Juan Road Improvements	North County	Construct traffic signals at the Aromas Road and Carpenteria Road intersections. Widen to four lanes from Pajaro to US-101.
G-12 Improvements	North County LCP	Widen to four lanes on San Miguel Canyon Road between Castroville Boulevard and Hall Road. Perform intersection improvements on Hall Road at Sill Road and Willow Road. Widen to four lanes on Salinas Road between Railroad Avenue and Porter Drive.
G-17 Widening (Reservation Road)	Toro/Greater Salinas	Widen to four lanes on Reservation Road from Davis Road to SR-68. Construct traffic signal at Davis Road.
G-17 Widening (River Road)	Toro	Widen to four lanes from Las Palmas Road to Las Palmas Parkway.
Salinas Road Improvements	North County/North County LCP	Widen to four lanes between future SR-1 and Salinas Road interchange and existing four-lane section. Install traffic signal and construct intersection improvements at Werner Road intersection. Construct signals on Elkhorn Road at Salinas Road and Werner Road intersections. Alternatively, re-align Salinas Road and Werner Road to intersect Elkhorn Road at a single location with a traffic signal.
Castroville Improvements	North County	Extend Castroville Boulevard to Blackie Road. Construct Artichoke Avenue Phases I, II and III from SR-1 to Poole Street. Implement Merritt Street corridor improvements.
San Juan Grade Road Improvements	Greater Salinas	Widen to four lanes from Salinas City Line to Crazy Horse Canyon Road. Install traffic signals at Rogge Road, Hebert Road and Crazy Horse Canyon Road.
Crazy Horse Canyon Road Improvements	North County	Add turn lanes or passing lanes from San Juan Grade Road to US-101.
Hebert Road/Old Stage Road Widening	Greater Salinas	Widen Hebert Road to four lanes from San Juan Grade Road to Old Stage Road and widen Old Stage Road to four lanes from Hebert Road to Natividad Road. Install traffic signal at Natividad Road. Add turn lanes on Old Stage Road from Natividad Road to Williams Road.
Espinosa Road Widening	Greater Salinas	Add turn lanes or passing lanes on Espinosa Road between SR-183 and US-101.

Source: Kimley-Horn and Associates, Inc.

Existing plus Project Buildout of the General Plan

Existing plus Project Conditions Buildout of the General Plan represents existing conditions plus full buildout of unincorporated County land allowed under the 2007 General Plan. The number of potential housing units that can be developed in unincorporated Monterey County was determined from the number of vacant residential lots and the assigned zoning within each planning or community area; calculated to be 35,918 new housing units beyond 2006.

Buildout of housing units was converted to an annual rate of development, calculated to be 417 housing units. Dividing the total amount of buildout development by the annual rate of development yielded the number of years to reach buildout, calculated to be 86 years beyond 2006, or the year 2092.

Employment projections are based on the rate of growth in housing units and population by maintaining the employee per housing unit ratio contained in the 2004 AMBAG land use forecasts. In this scenario, no changes were made to the land uses within incorporated areas.

The coastal areas (including Big Sur and the Del Monte Forest) do not include any growth as new development is not expected to occur in these areas.

This scenario uses the modified AMBAG base year roadway network reflecting 2008 conditions. No major improvement projects that would affect regional roadways have been constructed following the last revision to the model network. To develop buildout (year 2092) traffic projections the percent annual growth on each roadway segment between the base model (year 2000) and the Existing plus Project (buildout to the year 2092) scenario was applied over 84 years (2008 to 2092) to existing 2008 traffic volumes.

The traffic projections show traffic volumes on segments of U.S. 101 and SR-1 decreasing between base year and existing plus project conditions. This is due to changes in travel patterns because of upstream or downstream congestion (traffic finding alternative routes) and/or changes in proximity between jobs and housing changing overall commute patterns. As a conservative approach so that the projections do not result in negative growth, the traffic projections were adjusted to maintain a minimum of a 0.1% annual increase for all state highways. This methodology was utilized for all model scenarios.

Buildout Cumulative plus Project (Cumulative and Project Development to the Year 2092)

The Buildout Cumulative plus Project scenario forecasts year 2092 conditions. Development in unincorporated portions of the County was determined by the methodology described in the Existing plus Project (Buildout of the General

Plan) scenario described above. Development in the incorporated portion of the County was projected at three times the rate of development in the unincorporated portion of the County. This 3:1 ratio for development in the incorporated part of the County versus the unincorporated part of the County is based on projected housing unit development out to 2030 in the adopted 2004 and proposed 2008 AMBAG Population, Employment and Housing Unit forecasts. The AMBAG forecasts indicate that the incorporated areas grow at a rate three times that of unincorporated areas.

Employment in the incorporated portions of the County was increased at the same rate as the growth of housing units, based on a methodology to maintain a constant employee per housing unit ratio.

The network used for this scenario is the improved network, which includes the above-mentioned TAMC fee program and projected County improvement projects. No capital roadway projects were assumed beyond those identified for the year 2030 as described above.

To develop buildout (year 2092) traffic projections the percent annual growth on each roadway segment between the base model (year 2000) and the Existing plus Project (buildout to the year 2092) scenario was applied over 84 years (2008 to 2092) to existing 2008 traffic volumes.

4.6.3.3 Study Area

The roadways selected for inclusion in this analysis include all state highways within the County, Major County roads, regional arterials, and local roads with a current volume of at least 3,000 daily trips. This includes 281 segments on 100 different highways and roadways within Monterey County. The roadways included in the study area are shown on Exhibit 4.6.6.

In addition to Monterey County roadways, the analysis includes regional roadways external to the County that might be impacted by growth allowed under the General Plan in Santa Cruz, San Benito, and San Luis Obispo Counties. Regional roadways external to the county studied include:

- Santa Clara County
  - US Highway 101 - Cochrane Rd to E Dunne Ave
  - US Highway 101 - Masten Ave to Leavesley Rd/SR-152 West
  - US Highway 101 - Monterey Rd to SR-25
  - SR-152 -SR-156 to Merced County
- Santa Cruz County
  - SR-1 - Soquel Ave to 41st St
  - SR-1 - Airport Blvd to SR-152

- SR-1 - Harkins Slough Rd to SR-129
- SR-1 - SR-129 to Monterey County
- SR-17 - Santa Clara County to Granite Creek Rd
- SR-129 (Riverside Rd) - Lakeview Rd to Carlton Rd

- San Benito County
  - US Highway 101 - Santa Clara County to SR-129
  - SR-25 (Bolsa Rd) - Santa Clara County to SR-156
  - SR-156 - Salinas Rd to Union Rd
- San Luis Obispo County
  - US Highway 101 – Monterey County to San Miguel Ave

4.6.3.4 Criteria for Determining Significance

This EIR evaluates potential impacts under six thresholds of significance including roadway level of service, air traffic, roadway hazards, emergency access, parking and alternative transportation. These thresholds conform to CEQA impact assessment requirements. Each threshold of significance is described below.

- Roadway Level of Service – The General Plan does not specify the methodology or measure of performance used to determine level of service, which can vary depending on the characteristics and scale of the project. For analysis of the General Plan, the level of service (LOS) for roadway segments is based on the ratio of projected daily traffic volume to the capacity of the roadway (V/C Ratio). This measure is derived from the methodology contained in the 2000 Highway Capacity Manual. It is a planning methodology suitable for evaluating long-range impacts of large areas such as Monterey County. This measure is applied to two of the three tiers of impacts described earlier; Tier 2: county roads and Tier 3: regional roads and major roads in incorporated cities. This measure is not applied to the first tier of impacts-direct impacts-which are impacts specific to individual developments related to access and localized impacts. The LOS standard in the 2007 General Plan is LOS D and can be applied to either average daily traffic or peak hour traffic. For the analysis of the General Plan, the analysis is based on daily traffic volumes.

  The 2007 General Plan would have a significant effect on the street and highway system if the land use development allowed under the General Plan would:

  - Cause an increase in traffic, which would cause a State Highway or County roadway to fall below the County's adopted standard of LOS D, or add any traffic to a County roadway or State Highway that operates below LOS D without the project and the project worsens the LOS based

on the measure of performance. The exception to this criterion is Policy C-1.1 in the General Plan Update which allows a lower LOS standard as:

- established in the community planning process,
- facilities operating below LOS D at the time the 2007 General Plan is adopted if the project does not further degrade the measure of performance, and
- established in Area Plans.

- Air Traffic – Would the development allowed under the General Plan result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Roadway Hazards – Would the development allowed under the General Plan substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Emergency Access – Would the development allowed under the General Plan result in inadequate emergency access;
- Alternative Transportation – Would the development allowed under the General Plan conflict with adopted policies, plans, or programs supporting alternative transportation or generate pedestrian, bicycle, or transit travel demand that would not be accommodated by current pedestrian facilities, bicycle development plans, or long-range transit plans.

4.6.3.5 Impact Analysis

This section describes the CEQA impact analysis relating to transportation impacts for the General Plan with development to 2030 and to buildout. It describes the methods used to determine the Project's impacts and identifies the thresholds used to conclude whether an impact would be significant. For each planning horizon and scenario, the roadway level of service impacts are presented in the three tiers described earlier; project-specific localized impacts, County roadways, and regional roadways (State Highways, major city streets, and regional roadways external to the County). Each scenario also presents a discussion of the impacts for the additional significance criteria. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

Roadway Level of Service

Existing plus Project Development to the Year 2030

Project-Specific Impacts of the Project

Impact TRAN-1A: Development allowed under the 2007 General Plan would cause project-specific impacts on County roadways which would cause roadways to fall below the acceptable LOS standard D. (Less-Than-Significant Impact).

Impact of Development with Policies

Project-specific impacts of new development are localized impacts that affect the immediate surrounding transportation system, including access and circulation necessary for the development to function properly and safely. Direct impacts occur where new development needs to gain access to County roadways and/or where traffic generated by new development causes project-specific deficiencies in roadway or intersection operations in the immediate proximity of the development.

Project-specific impacts would occur with the first phases of development (the first uses to be constructed and occupied that require access to the transportation system). New development would be fully responsible for the implementation of mitigation measures or would be responsible for its fair-share of the mitigation depending on the extent of the impact and the development's contribution to the impact. Under 2007 General Plan policies new development is required to mitigate project-specific local impacts to maintain the County's LOS standard and to provide adequate access and circulation facilities. These policies restrict new development or require phasing of new development so that it is concurrent with transportation improvements.

2007 General Plan Policies

The 2007 General Plan policies summarized below set forth measures to minimize adverse impacts of project-specific localized impacts of development. These measures apply to the project-specific impacts of development, but also to measures that may improve LOS indirectly.

Circulation Element

Policy 1.3 requires developments that degrade roads beyond LOS D to establish a plan for improving those facilities. Policy 1.4 requires circulation improvements that mitigate project-specific localized development impacts to be constructed concurrently with the development or for the development to pay a fair share towards the

improvements. Policies 2.1, 2.2, and 2.7 require land uses to be located with access to transportation facilities and for those facilities to expedite access to the development. Policies C3.5, 4.3, 4.5, and 4.9 require development to design public facilities to accommodate pedestrians, bicycles, and transit thus reducing the impacts caused by automobile traffic.

Land Use Element

Policies LU 1.4 and 1.7 require development to occur only when adequate transportation facilities exist and to encourage phasing and clustering of development to provide for adequate long-range planning of infrastructure.

Area Plan Policies

The Area Plans contain a number of policies related to project-specific localized impacts. The Area Plan policies and mitigations would supplement those contained in the Area Plans, consistent with the 2007 General Plan.

North County Area Plan

The North County Area Plan Policy NC 1.1 requires new commercial development to minimize its traffic impacts through mitigation.

Greater Salinas Area Plan

The Greater Salinas Area Plan Policy GS 1.7 requires new development in the Spence/Potter/Encinal Road Area to study and mitigate its impact on highway access and road capacity.

Central Salinas Valley Area Plan

Central Salinas Valley Area Plan Policy 1.4 requires new development in the Spence/Potter/Encincal Road Area to study and mitigate its impact on highway access and road capacity.

Significance Determination

Project-specific impacts of new development are localized impacts that affect the immediate surrounding transportation system, including access and circulation necessary for the development to function properly and safely. Project-specific impacts occur where new development needs to gain access to county roadways and/or where traffic generated by new development causes project-specific deficiencies in roadway or intersection operations. Project-specific impacts would occur with the first phases of development.

New development is required to prepare a project-level traffic study, or project-level Environmental Impact Report. Impacts to roadway LOS or project access would be identified in these studies and development would be fully responsible for the implementation of mitigation measures or would be responsible for its fair-share of the mitigation depending on the extent of the impact and the development's contribution to the impact. If a roadway already falls below the County's LOS standard, then the development is required to mitigate its impact so that the measure of performance (e.g., volume to capacity ratio, peak hour average delay, etc.) of the roadway does not degrade beyond the level without the development. This is a less than significant impact.

Mitigation Measures

Impacts are less than significant, therefore no mitigation is necessary.

Significance Conclusion

Implementation of the 2007 General Plan consistent with policies related to project-specific localized impacts (Policy C-1.4, new development is required to mitigate project-specific local impacts to maintain the County's LOS standard and to provide adequate access and circulation facilities. Policy C-1.3 restricts new development or requires the phasing of new development so that it is concurrent with transportation improvements) would have a less than significant impact and no mitigation is required.

County and Regional Roadway Level of Service Impacts (Existing plus Project Development to the year 2030)

Impact TRAN-1B: Development of the land uses allowed under the 2007 General Plan would create *traffic increases on* County and Regional roadways which would cause the LOS to exceed the LOS standard, or contribute traffic to County and Regional roads that exceed the LOS standard without development. (Significant and Unavoidable Impact)

Impact of Development with Policies

The LOS on study area roadways for the Existing plus Project Development to the year 2030 is shown in Exhibit 4.6.7. A detailed analysis of roadway level of service by segment is included in the Appendix.

Table 4.6-13 shows the roadway segments operating at deficient LOS D, LOS E or LOS F under this scenario and compares the segments to their LOS under existing conditions. Some roadway segments experience an improvement in the volume to capacity ratio as a result of the 2007 General

Plan. This is due to a change in traffic patterns in the future causing the redistribution of housing and jobs.

As shown in Table 4.6-13, there are 10 segments that operate at LOS E and 25 segments that operate at LOS F in this scenario. In comparison, under existing conditions, 29 of the segments in Table 4.6-14 currently operate at LOS E or F. The development in the County up to the year 2030 causes an additional six roadway segments to exceed the county's LOS threshold. Impacts of the 2007 General Plan within the Carmel Valley Plan Area are discussed in the next section (Year 2030 Cumulative Conditions with Project).

Table 4.6-14. County Roadway Segments Operating at LOS E or F under Existing plus Project Development to the Year 2030

		Existing Conditions		Existing + Project Development to the Year 2030	
Roadway Segment		V/C Ratio	LOS	V/C Ratio	LOS
Roadway Segments Operating at LOS F					
County Road G11 (San Juan Rd)	Salinas Rd to San Miguel Canyon Rd	0.942	E	1.087	F
County Road G12 (Salinas)	Porter Dr to Railroad Ave	1.236	F	1.226	F
County Road G12 (Elkhorn Rd)	Salinas Rd to Hall Rd	1.339	F	1.185	F
County Road G12 (Hall Rd)	Elkhorn Rd to San Miguel Canyon Rd	1.879	F	1.627	F
County Road G12 (San Miguel Canyon Rd)	Strawberry Rd to Castroville Blvd	1.485	F	1.216	F
County Road G12 (San Miguel Canyon Rd)	Castroville Blvd to US-101	1.486	F	1.130	F
County Road G14 (Jolon)	US-101 to San Lucas Rd	0.582	D	1.062	F
County Road G17 (River Rd)	Las Palmas Rd to Las Palmas Pkwy	0.805	D	1.007	F
Blanco Rd	Cooper Rd to Armstrong Rd	2.146	F	2.100	F
Blanco Rd	Armstrong Rd to Davis Rd	2.292	F	2.242	F
Carpenter St	Serra Ave to SR-1	1.354	F	1.433	F
Davis Rd	Blanco Rd to Reservation Rd	0.958	E	1.021	F
Ocean Ave	Carmel City Line to SR-1	1.229	F	1.271	F
Pine Canyon Rd (King City)	Merrit St to Jolon Rd	0.583	D	1.646	F
Porter Dr	San Juan Rd to Santa Cruz County Line	1.423	F	1.471	F

Roadway Segment		Existing Conditions V/C Ratio	Existing Conditions LOS	Existing + Project Development to the Year 2030 V/C Ratio	Existing + Project Development to the Year 2030 LOS
Rio Rd	Carmel City Line to SR-1	1.161	F	1.219	F
San Juan Grade Rd	Salinas City Line to Russell Rd	1.015	F	1.164	F
San Juan Grade Rd	Russell Rd to Rogge Rd	0.747	D	1.014	F
Roadway Segments Operating at LOS E					
County Road G11 (San Juan Rd)	Aromas Rd to Carpenteria Rd	0.938	E	0.967	E
Abbott St	SH 101 to Salinas City Line	0.896	E	0.878	E
Carpenter St	Carmel City Line to Serra Ave	0.828	E	0.802	E
Espinosa Rd	SR-183 to US-101	0.896	E	0.896	E
Harris Rd	Spreckels Blvd to Abbott St	0.844	E	0.813	E
Hebert Rd	San Juan Grade Rd to Old Stage Rd	0.443	D	0.885	E
Old Stage Rd	Hebert Rd to Natividad Rd	0.488	D	0.933	E
Porter Dr	Salinas Rd to San Juan Rd	0.967	E	0.942	E
Russell Rd	SR-101 to San Juan Grade Rd	0.661	D	0.802	E

Source: Kimley-Horn and Associates, Inc.

Table 4.6-15 presents the roadway segments operating at LOS E or LOS F under Existing plus Project Development to the Year 2030 conditions and compares the segments to their LOS under existing conditions. Exhibit 4.6.7 presents the segment LOS graphically. A detailed table showing the volume, the volume to capacity ratio and the resulting LOS for each Regional roadway segment is included in the Appendix. There are six (6) regional roadway segments that operate at LOS E and 51 segments that operate at LOS F under this scenario. Under existing conditions, 55 of these Regional roadway segments operate at LOS E or F, so development in the County up to the year 2030 causes an additional two (2) roadway segments to exceed the County's LOS threshold.

Table 4.6-15. Regional Roadway Segments Operating at LOS E or F under Existing plus Project (Horizon Year 2030) Conditions

Roadway Segment		Existing Conditions V/C Ratio	Existing Conditions LOS	Existing + Project Development to the Year 2030 V/C Ratio	Existing + Project Development to the Year 2030 LOS
Roadway Segments Operating at LOS F in the Existing plus Project Development to the Year 2030 Scenario					
US Highway 101	County Border to Crazy Horse Canyon Rd	1.044	F	1.067	F
US Highway 101	Crazy Horse Canyon Rd to San Miguel Canyon Rd	0.989	E	1.011	F
US Highway 101	San Miguel Canyon Rd to SR-156	1.441	F	1.474	F
US Highway 101	SR-156 to Pesante Rd	1.106	F	1.131	F
US Highway 101	Pesante Rd to Espinosa Rd	1.106	F	1.131	F
US Highway 101	Espinosa Rd to E Boronda Rd	1.098	F	1.123	F
US Highway 101	E Boronda Rd to W Laurel Dr	1.143	F	1.169	F
US Highway 101	W Laurel Dr to N Main St	1.107	F	1.140	F
US Highway 101	N Main St to E Market St	1.172	F	1.198	F
US Highway 101	E Market St to John St	1.114	F	1.145	F
SR-1	Salinas Rd to Struve Rd	1.546	F	1.582	F
SR-1	Struve Rd to Dolan Rd	1.667	F	1.703	F
SR-1	Dolan Rd to Molera Rd	1.496	F	1.530	F
SR-1	Molera Rd to SR-183	1.426	F	1.458	F
SR-1	Fremont Blvd to Canyon del Rey Blvd	1.006	F	1.027	F
SR-1	Canyon del Rey Blvd to Del Monte Ave	1.071	F	1.094	F
SR-1	N Fremont St to Aguajito Rd	1.411	F	1.443	F
SR-68 (Holman Highway)	Forest Ave to 17 Mile Dr	1.448	F	1.552	F
SR-68 (Holman Highway)	17 Mile Dr to Skyline Forest Dr	1.638	F	1.761	F
SR-68 (Holman Highway)	Skyline Forest Dr to CHOMP Dwy	1.638	F	1.761	F
SR-68 (Holman Highway)	CHOMP Dwy to SR-1	1.638	F	1.742	F
SR-68 (Monterey Salinas Highway)	SR-1 to Olmsted Rd	1.422	F	1.464	F
SR-68 (Monterey Salinas Highway)	Olmsted Rd to Canyon del Rey Blvd	1.422	F	1.431	F

Roadway Segment		Existing Conditions		Existing + Project Development to the Year 2030	
		V/C Ratio	LOS	V/C Ratio	LOS
SR-68 (Monterey Salinas Highway)	Canyon del Rey Blvd to Bit Rd	1.304	F	1.331	F
SR-68 (Monterey Salinas Highway)	Bit Rd to Laureles Grade Rd	1.304	F	1.307	F
SR-68 (Monterey Salinas Highway)	Laureles Grade Rd to Corral de Tierra	1.525	F	1.552	F
SR-68 (Monterey Salinas Highway)	Corral de Tierra to Portola Dr	1.617	F	1.638	F
SR-156	Castroville Blvd to US-101	1.902	F	1.939	F
SR-183 (Merritt St)	SR-156 to Blackie Rd	1.184	F	1.202	F
SR-183 (Castroville Rd)	Blackie Rd to Espinosa Rd	1.074	F	1.049	F
SR-218 (Canyon del Rey Blvd)	Fremont Blvd to Carlton Dr	1.099	F	1.130	F
SR-218 (Canyon del Rey Blvd)	Carlton Dr to SR-68	1.099	F	1.164	F
Foam St	Prescott Ave to Drake Ave	1.156	F	2.258	F
Foam St	Drake Ave to Lighthouse Ave	1.277	F	2.392	F
Lighthouse Ave	Prescott Ave to Private Bolio Rd	1.637	F	1.045	F
Lighthouse Ave	Private Bolio Rd to Pacific St	1.270	F	1.188	F
Lighthouse Ave	Pacific St to Washington St	1.124	F	1.061	F
Del Monte Ave	Washington St to Camino Aguajito	1.314	F	1.304	F
Del Monte Ave	Camino Aguajito to Casa Verde Wy	1.313	F	1.288	F
Del Monte Ave	Casa Verde Wy to SR-1	1.443	F	1.421	F
Fremont St	Abrego St to Camino Aguajito	1.065	F	1.052	F
Munras Ave/Abrego St	Soledad Dr to Via Zaragoza	1.226	F	1.338	F
Del Monte Blvd	SR-1 to Canyon del Rey Blvd	1.039	F	1.016	F
Del Monte Blvd	Canyon del Rey Blvd to Broadway Ave	1.058	F	1.049	F
Del Monte Blvd	SR-1 to Reindollar Ave	1.081	F	1.029	F
Del Monte Blvd	Reindollar Ave to Reservation Rd	1.929	F	1.838	F
John St	Abbott St to US-101	1.069	F	1.065	F
Davis Rd	W Laurel Dr to SR-183	1.057	F	1.110	F
Davis Rd	SR-183 to W Blanco Rd	2.428	F	2.521	F

Roadway Segments Operating at LOS E in the Existing plus Project Development to the Year 2030 Scenario

Roadway Segment		Existing Conditions V/C Ratio	Existing Conditions LOS	Existing + Project Development to the Year 2030 V/C Ratio	Existing + Project Development to the Year 2030 LOS
US Highway 101	John St to S Sanborn Rd	0.897	D	0.918	E
SR-1	Holman Hwy to Carpenter St	0.890	D	0.945	E
SR-183 (Castroville Rd)	Espinosa Rd to Cooper Rd	1.012	F	0.988	E
N Fremont St	Casa Verde Wy to SR-218	0.971	E	0.981	E
Sanborn Rd	US-101 to Abbott St	0.983	E	0.974	E
S Main St	Romie Ln to E Blanco Rd	0.817	D	0.854	E

Source: Kimley-Horn and Associates, Inc.

Table 4.6-16 presents compares existing and Existing plus Project Development to the Year 2030 roadway LOS on Regional roadways external to Monterey County. Traffic generated by the land uses allowed under the 2007 General Plan will produce inter-county travel between housing and jobs in Santa Cruz, San Benito, and Santa Clara counties, and to a lesser extent San Luis Obispo County. The affects of this inter-county travel is shown in the table.

The Existing plus Project Development to the Year 2030 is project level analysis required under CEQA. Under this scenario some of the external roadway segments experience an improvement over existing conditions. This is because the Existing plus Project Development to the Year 2030 only considers development of unincorporated Monterey County and does not include growth in incorporated Monterey County, or any growth in adjacent counties. Therefore, in this scenario where only growth unincorporated County is considered, there is a better balance of housing and jobs (both in numbers and proximity) within unincorporated Monterey County than if cumulative growth elsewhere were considered as well. This housing and jobs balance results in trips remaining internal to communities within unincorporated Monterey County and traveling shorter distances. This effect on travel is not found to this extent under cumulative conditions.

Table 4.6-16. Roadway Level of Service of Facilities External to Monterey County under Existing plus Project Development to the Year 2030

		Existing Conditions		Existing + Project Development to the Year 2030	
Roadway Segment		V/C Ratio	LOS	V/C Ratio	LOS
Santa Clara County					
US Highway 101	Cochrane Rd to E Dunne Ave	1.139	F	0.882	D
US Highway 101	Masten Ave to Leavesley Rd/SR-152 West	0.989	E	0.858	D
US Highway 101	Monterey Rd to SR-25	1.071	F	1.007	F
SR-152	SR-156 to Merced County	0.630	C	0.632	C
Santa Cruz County					
SR-1	Soquel Ave to 41st St	1.368	F	1.101	F
SR-1	Airport Blvd to SR-152	0.876	D	0.674	C
SR-1	Harkings Slough Rd to SR-129	0.608	C	0.466	B
SR-1	SR-129 to Monterey County	0.492	B	0.363	B
SR-17	Santa Clara County to Granite Creek Rd	0.958	E	1.005	F
SR-129 (Riverside Rd)	Lakeview Rd to Carlton Rd	0.847	D	0.871	D
San Benito County					
US Highway 101	Santa Clara County to SR-129	0.912	E	0.848	D
SR-25 (Bolsa Rd)	Santa Clara County to SR-156	1.196	F	1.080	F
SR-156	Salinas Rd to Union Rd	1.706	F	1.742	F
San Luis Obispo County					
US Highway 101	Monterey County to San Miguel Ave	0.300	A	0.308	A

Source: Kimley-Horn and Associates, Inc.

Impact of Goods Movement on Roadway Level of Service

The county's current truck traffic generation is expected to increase from 12,600 truck trips per day (2006) to 18,600 in 2030. This increase in freight movement is not significant enough to cause widespread capacity-related impacts, but will contribute large vehicle traffic to roadways and highways that are currently, or are projected to fall below the County's acceptable LOS standard and may cause the localized impacts on heavily traveled freight

routes (e.g., Highways 1, 101, 156, and 183) and within industrialized areas where truck traffic originates.

2007 General Plan Policies

The 2007 General Plan policies summarized below set forth measures to minimize adverse impacts on level of service.

Circulation Element

The Circulation element contains a number of policies to mitigate the traffic impacts of the development allowed under the 2007 General Plan. These policies range from establishing performance standards to mechanisms to identify impacts and fund infrastructure improvements to requiring infrastructure for promoting the use of alternatives to the automobile. These policies are described below.

Circulation Element Policy 1.1sets a standard of LOS D on County roads establishing a minimum threshold beyond which mitigation measures are required. Policy1.2 sets standards for how to identify and implement transportation improvements to mitigate significant impacts, and Policy 1.3 requires developments that degrade roads beyond LOS D, or contribute traffic to roadways already exceeding LOS D, to establish a plan for improving those facilities.

Policy 1.4 requires circulation improvements that mitigate development impacts to be constructed concurrently with the development or for the development to pay a fair share towards the improvements. Policies C1.5 and 1.10 require transportation agencies to work together to improve congestion. This would occur through coordination of regional and countywide traffic impact fees, and development of the Regional Transportation Plan.

Policies 1.6 through1.9, and 1.11 address funding of transportation improvements by establishing impact fees, finding alternative funding sources, and prioritizing transportation funding. The County is currently preparing a countywide nexus study for establishing a Countywide Traffic Impact Mitigation Fee.

Policies 2.4 through 2.6 encourage reduction in personal automobile usage in favor of bicycle and transit usage to reduce the LOS impact caused by traffic generation. Policies 3.5, 4.3, 4.5, and 4.9 address the design of public facilities to accommodate pedestrians, bicycles, and transit to provide the necessary infrastructure to accommodate these modes and reduce traffic.

Public transit service, an important strategy in reducing traffic impacts, is addressed in Circulation Element Policies 6.1 through 6.9 by encouraging coordinated service between providers, regular

service for mobility-impaired people, and service to major traffic generating events or uses. Policies 8.1 through 8.4 encourage rail transportation to commercial centers and transit-oriented development to encourage use of public transportation, and to create mixed-use centers where walking and bicycling are viable modes of transportation. Policies 10.1through 10.7 promote bicycle as an alternative mode of travel by providing bike routes and bike parking along major roadways and visitor destinations.

Area Plan Policies

The Area Plans contain a number of policies related to LOS and mitigating traffic impacts. The Area Plan policies and mitigations would supplement those contained in the General Plan, consistent with the 2007 General Plan.

North County Area Plan

The North County Area Plan Policy 1.1 requires new commercial development in proximity to housing so that residents can minimize long distance travel and reduce traffic impacts. Policy 2.1 addresses providing a bypass of Highway 101 north of Salinas to provide additional highway capacity, and improve access to new development to minimize impacts to county and local roads.

Central Salinas Valley Area Plan

Central Salinas Valley Area Plan Policy 1.4 requires new development in the Spence/Potter/Encincal Road Area to analyze and mitigate its road capacity impacts.

Greater Monterey Peninsula Area Plan

The Greater Monterey Peninsula Area Plan Policies 2.1 through 2.5 and 2.7 encourage transit use to decrease peak hour traffic and LOS impacts. These policies also provide for roadway improvements to Highway 68 and its alternate routes to improve existing and future deficiencies.

Greater Salinas Area Plan

The Greater Salinas Area Plan Policy 1.7 requires new development in the Spence/Potter/Encinal Road Area to study and mitigate the impact on highway access and road capacity. Policies 2.1 and 2.2 address congestion on Highway 101 by encouraging the bypass to add capacity and improve access. These policies also specify the need to design and implement an additional bypass road around Salinas (Western Bypass).

Carmel Valley Master Plan

The Carmel Valley Master Plan Policies 2.1, 2.3 through 2.6, and 2.13 through 2.15 encourage alternate modes of transportation including transit, bicycle, and pedestrian access to provide viable alternatives to driving and to reduce traffic impacts. They also consider improvements to Carmel Valley Road which would mitigate existing deficiencies and future LOS impacts. Policy 2.12 provides recommendations for road improvements to Highway 1, Laureles Grade, and Carmel Valley Road to achieve LOS C or LOS D as specified in the plan. Policy 2.19 requires evaluation and monitoring of streets and highways to identify when to implement improvements to meet LOS standards.

Toro Area Plan

Toro Area Plan Policies 2.1 through 2.7 and 2.9 through 2.10. encourage roadway and transit improvements to relieve congestion and identify funding sources from new developments.

Cachagua Area Plan

Cachagua Area Plan Policy 2.6 requires LOS C as an acceptable LOS within the planning area. New development in this plan area is required to meet this standard and mitigate impacts to maintain the standard.

South County Area Plan

The South County Area Plan Policy 1.2 encourages clustered development, which contributes to the mitigation of LOS impacts by creating an environment where people can walk, bicycle, or use transit as an alternative to driving.

2007 General Plan Policies Related to Goods Movement

The 2007 General Plan policies summarized below set forth measures to address the impacts of goods movement on traffic level of service.

Circulation Element

Circulation Element Policies C 2.1 and 2.3 encourages establishing safety standards to guide land use for safe operation of the transportation system, including land uses that support freight movement, and for land uses requiring commodity movement to be given adequate access to transportation facilities. Policies C 4.10 and 4.11 encourage improvement and maintenance of roads that carry significant amounts of freight traffic and provide for off-street loading areas.

Agricultural Element

Agricultural Element Policy 6.1 encourages improvement of the regional transportation system to support the agricultural industry. This would include providing adequate capacity to accommodate increases in truck traffic.

Area Plan Policies Related to Goods Movement

A limited number of Area Plans contain policies related to goods movement. The Area Plan policies would supplement those contained in the General Plan, and are consistent with the 2007 General Plan policies.

Greater Monterey Peninsula Area Plan

The Greater Monterey Peninsula Area Plan Policy GMP 2.3 discourages heavy vehicles from using the Laureles Grade.

Greater Salinas Area Plan

The Greater Salinas Area Plan Policy 2.1 establishes a priority for the improvement of Highway 68 including the construction of alternate passing lanes, which would reduce the impacts of trucks on grades and narrow segments. Policy 2.3 identifies improvements to Laureles Grade such as shoulder widening, passing lanes, and paved turn-outs that increase safety for larger vehicles. At the same time, this policy also discourages use of heavy vehicles on Laureles Grade.

Carmel Valley Master Plan

Carmel Valley Master Plan Policy 2.15 supports consideration for a northbound climbing lane on Laureles Grade.

Cachagua Area Plan

The Cachagua Area Plan Policy CACH 2.5 requires projects that generate heavy vehicles to restore and maintain roads to their existing condition.

Agricultural and Winery Corridor Plan (AWCP)

Policy 3.7 requires that access to facilities in the AWCP shall be designed to meet safe sight distance standards as determined by the Monterey County Public Works department, particularly for uses that generate truck traffic.

Significance Determination

Development and land use allowed under the 2007 General Plan would increase traffic volumes on County roads, Regional roads, and regional roads external to the County. This added traffic would both cause roadway segments to exceed the County's LOS standard, and contribute traffic to roadways that exceed the LOS standard without development, and further degrade the performance measure.

The 2007 General Plan and Area Plans establish policies to mitigate or reduce these impacts. These policies encourage alternative modes of travel including public transit, bicycle, and pedestrian modes to reduce the use of automobiles. They encourage compact, mixed-use, and transit-oriented development in developed areas in patterns that have been demonstrated to reduce traffic. In combination, these policies serve to decrease the number of trips by vehicle and decrease the total length of trips, which in turn minimizes degradation of LOS. The policies in the general plan also provide a funding mechanism, through implementation of a countywide traffic impact fee, and coordination with a regional traffic impact fee. These resources are intended to provide funding for transportation improvements.

Despite development contributions to project-specific local impacts (through project-level mitigation), county impacts (through countywide traffic impact fee), and regional impacts (through regional traffic impact fee) there will remain a funding shortfall for the implementation of the financially constrained capital facilities in the Regional Transportation Plan. Implementation of the mitigation listed above in conjunction with the 2007 General Plan policies, and working collaboratively with cities and regional agencies would contribute to the mitigation of roadway LOS impacts. However, even with the adoption of county and regional impact fees, which fund a limited number of transportation facilities, traffic impacts to County and regional roadways will remain significant and unavoidable.

Mitigation Measures

No mitigation is feasible. Mitigation of the LOS impacts described above would require a substantial number of County and Regional roadway widening, and intersection modifications to provide enough capacity to achieve the County's LOS D standard on all impacted segments, some outside of Monterey County. Additionally, mitigation would include substantial increases in public transportation services.

Many of the mitigations for these roadways segments are infeasible due to physical, topographical, and environmental constraints, as well the social and economic impacts related to the acquisition of commercial and residential property, or loss of access, for roadway capacity-enhancing projects. The foremost constraint, however, is funding of transportation facilities. Federal, state and regional funding are limited, and most of these funds are used to maintain the transportation system. The County

and TAMC are planning to implement Traffic Impact Fees to fund improvement projects, but the amount of the fees are limited for affordability and total fee burden reasons.

The County and regional fee programs will continuously be updated, adding additional priority projects to the programs as initial projects are completed, but the rate of project completion will not be able to outpace the rate of development growth.

Significance Conclusion

Implementation of the 2007 General Plan would have a significant and unavoidable impact on County roads, and Regional roads both within and external to Monterey County. The County has developed a list of capital improvements to be included in a countywide traffic impact fee, as described above. In addition, TAMC has adopted a list of capital improvements to be funded by their adopted Regional Traffic Impact Fee. Neither the County nor TAMC projects fully mitigate the impacts of the 2007 General Plan, but provide significant improvement to County and Regional roadway segments beyond existing conditions and Existing plus Project Development to the Year 2030 conditions. Therefore, impacts remain significant and unavoidable.

Air Traffic

Impact TRAN 1-C: Growth in land uses allowed under the 2007 General Plan would increase demand for air travel at the County's four airports or increase development within the approach and departure pattern of airports.

Impact of Development with Policies

The 2007 General Plan increases the allowable amount of development within the County, which would cause an increase in demand for commercial passenger, general aviation, and freight-related air travel. Development of the Agricultural and Winery Corridor Plan (AWCP) will increase the area as a tourist destination, and therefore will contribute to increased commercial and private passenger air travel. Although the increase in air travel related to the AWCP will increase gradually through 2030 as new winery facilities develop over time. However, the General Plan does not require any changes to air traffic patterns.

Further, the 2007 General Plan includes development near airports. Specifically, Policy 2.12 in the Land Use Element allows for the Hwy 68/Monterey Peninsula Airport Affordable Housing Overlay which will increase housing and density in an 85 acre area adjacent to the Monterey

Peninsula Airport. The overlay area is to the south of the airport and not within the approach or departure flight paths of the runways.

2007 General Plan Policies

The 2007 General Plan policies summarized below set forth measures to minimize impacts of air traffic.

Circulation Element

Circulation Element Policies 7.1 through 7.5 promote safe, efficient air facilities. They provide for appropriate land uses around air facilities in order to mitigate noise and safety impacts on land use. The policies also provide for control of the impact of private air facilities on agricultural land use and surrounding areas.

Area Plan Policies

The Area Plans contain policies related to air traffic. The Area Plan policies and mitigations would supplement those contained in the General Plan, consistent with the 2007 General Plan.

Greater Monterey Peninsula Area Plan

The Greater Monterey Peninsula Area Plan Policies 2. 8 and 4.2 require that development under the runway approaches of the Monterey Peninsula and Marina Municipal Airports be low intensity and not interfere with airport operations. It encourages adoption of noise and land use compatibility standards.

Cachagua Area Plan

The Cachagua Area Plan Policy 2.3 requires private airstrips to obtain a use permit to ensure that they do not negatively impact neighboring areas or flight paths from existing airports.

Significance Determination

Development of the land uses allowed under the 2007 General Plan by the year 2030 would result in an increase in demand for air travel. Passenger travel in Monterey County peaked in 1978 with about 640,000 passengers annually. Since that time passenger travel has declined to nearly half of its peak (Monterey Airport District, 2008). Without adding additional capacity at airports, the current passenger level could increase to at least 640,000 passengers annually without impacting airport operations (a 96% increase).

Land use growth proposed in the general Plan and specifically the Hwy 68/Monterey Peninsula Airport Affordable Housing Overlay will not be located within airport flight paths, and will not be design in such a way as to

become an incompatible land use (i.e., high rise buildings). No change in airport location is being proposed in the 2007 General Plan. (Less than Significant Impact).

Mitigation Measures

Impacts would be less than significant, therefore no mitigation measures are necessary.

Significance Conclusion

The development of the General Plan would increase the demand for the air travel. The General Plan contains policies to encourage safe operations of air facilities and land uses surrounding the airports that are consistent with airport operations. Airport passenger demand is significantly less than it was in 1978 and therefore can accommodate substantial increases without increasing the capacity of airports. Impacts of the General Plan policies under Existing plus Project Development to the Year 2030 are less than significant.

Roadway Hazards

Impact TRAN 1-D: Growth in land uses allowed under the 2007 General Plan would result in non-standard or hazardous designs or land uses that are incompatible with public facilities and adjoining land uses. (Less Than Significant)

Impact of Development with Policies

The development of the 2007 General Plan would allow the development of land uses that create hazards to various modes of transportation. This impact would include the provision of access to development that does not meet County design standards (such as inadequate sight distance, roadway curvature failing to meet design speed standards, etc.). This impact also includes the development of land uses that generate types of traffic incompatible with surrounding land uses and transportation facilities (such as industrial uses adjacent to, and gaining access from, local residential streets or schools). Incompatible types of traffic include slow-moving farm vehicles using roadways in urban or urbanizing areas.

As Monterey County develops, residential and commercial development may occur adjacent to or within current rural agricultural areas, increasing the conflict between uses and types of traffic.

2007 General Plan Policies

The 2007 General Plan policies summarized below set forth measures to minimize potential impacts of non-standard roadway design or incompatible land uses.

Circulation Element

Circulation Element policies provide for safety of the transportation network by requiring safety standards, providing for protection against incompatible land uses, and designing or expanding new roads to current standards. Policy 1.2 requires development and adoption of a Capital Improvement and Financing Plan (CIFP) and implementing ordinances that identify mechanisms to improve County roadways to meet design standards and improve safety. Policy 2.3 requires the use of safety standards established by transportation-related agencies to guide new development and transportation improvements. Policy 4.2 ensures that new roads and internal circulation roads are constructed to County standards. Policy 4.8 maintains the County's roadway safety programs that identify and improve hazardous or non-standard roadway designs.

Related to compatibility of land uses, Policy 2.2 protects existing and proposed public transportation facilities from the encroachment of incompatible land uses that would create unsafe development access or traffic conditions, or disallows uses that generate incompatible types of traffic from accessing major streets (e.g., farm equipment accessing major arterial roadways). Policy 7.1 prohibits any land use activities that would interfere with safe operations of aircraft, such as multi-story buildings within flight paths. Policies 7.2 and 7.4 ensures that proposed land uses in the vicinity of public airports are compatible with the airport comprehensive land use plan, and Policy 7.5 requires regulation of private airfields so that they do not impact agricultural lands, existing airport operations, public facilities, or neighboring areas. Policy 9.1 requires land uses in the vicinity of harbors to be compatible with commercial and recreational harbor operations.

Agricultural Element

Policy 6.1 encourages and supports improvement of regional transportation systems to support the needs of the agricultural industry (including safety design features).

Safety Element

Safety Element Policy 4.9 requires that roadways be constructed and maintained in accordance with Monterey County Code or the California Fire Code, which establishes minimum clear widths to

accommodate fire fighting apparatus, large freight vehicles, and emergency service providers.

Area Plan Policies

The Area Plans contain a number of policies related to non-standard design or incompatible land uses. The Area Plan policies would supplement those contained in the 2007 General Plan.

Carmel Valley Master Plan

The Carmel Valley Master Plan Policies 2.10 and 2.11encourage improvements to existing roadways, such as shoulder improvements on sharp curves on Esquiline Road. They also provide for channelization and tapers at access points on Carmel Valley Road for safety improvements.

Toro Area Plan

The Toro Area Plan Policy 2.7 limits new direct access points for single family residences along Highway 68 and limits them along other routes in the planning area in order to mitigate the impact of incompatible land use access onto major traffic corridors.

Cachagua Area Plan

The Cachagua Area Plan Policy 2.1 requires the signing and marking of roadways to alert all users to unusual or dangerous conditions.

Agricultural and Winery Corridor Plan

The AWCP contains development standards to ensure new development provides safe transportation facilities in this rural corridor.

The AWCP development standards include a standard for access design that requires access to facilities where the general public is allowed to meet safe sight distance standards.

Significance Determination

Development of the land uses allowed under the 2007 General Plan by the year 2030 would result in non-standard or hazardous designs and incompatible facilities with adjoining land uses. The General Plan provides for policies to prevent or reduce these impacts by requiring roads to be designed to safety standards. These policies require new development to design facilities to County standards. They also provide for road safety programs (signing, marking, and improved sight distance) to improve overall safety. The 2007 General Plan also has policies to limit incompatible land

uses. Therefore, the impact of roadway hazards with implementation the 2007 General Plan is less than significant.

Mitigation Measures

No additional mitigation measures beyond the 2007 General Plan are necessary.

Significance Conclusion

The development under the General Plan would result in non-standard or hazardous transportation facility designs or land uses that are incompatible with public facilities. However, the 2007 General Plan contains policies to ensure that new development provides access and improvements to the county roadway system to meet County standards. It also contains policies to prevent incompatible land uses to avoid transportation conflicts and roadway hazards. Therefore, the impact is less than significant.

Emergency Access

Impact TRAN 1-E: Growth in land uses allowed under the 2007 General Plan would result in inadequate emergency access. (Significant and Unavoidable)

Impact of Development with Policies

The development under the 2007 General Plan would impact the response time for emergency vehicles on roadways projected to exceed the County standard LOS D. This impact would occur in the more developed areas of the County (i.e., North County, Greater Monterey Peninsula, Carmel Valley, and some Community Areas) which experience higher concentrations of roadways operating at LOS E or F.

The development of the Existing plus Project Development to the Year 2030 will cause 114 County and Regional roadway segments to exceed LOS D, which would have an impact on emergency vehicle response time.

2007 General Plan Policies

The 2007 General Plan policies summarized below set forth measures to minimize impacts on emergency vehicles.

The General Plan Land Use Element and Public Services Element support limiting growth outside of areas where infrastructure and services are available.

Circulation Element

The Circulation Element contains policies to identify and mitigate impacts to roadway level of service, as well as establish mechanisms to fund transportation projects to improve level of service. These policies are described under the Roadway Level of Service section above.

Land Use Element

Land Use Element Policy 1.4 focuses urban growth in areas where there are adequate levels of service for emergency response to avoid inadequate response because of lack of emergency provider facilities and long distances. Police 1.19 (Evaluation System) would result in a low ranking, if not a failing score, for new subdivisions in remote areas, since these would not comply with General Plan policies regarding water, sewer, and services. Development on existing lots of record are exempted from this policy and these new homes, if constructed in remote areas, would not be expected to receive services in the same timeframe as other new residential development. The General Plan policies include maximum response times that range from 5-8 minutes in urban areas to as high as 45 minutes in rural areas. Nevertheless, because of existing development and future development on lots of record in more remote areas and highway congestion, emergency response time less than the policy maximums may difficult to achieve.

Safety Element

Safety Element Policies 4.9 and 5.15 require roadways to be constructed according to the fire code, which establishes minimum clear widths to accommodate fire fighting apparatus and emergency service providers, and be designed for tsunami evacuation along developed coastal areas where appropriate. Policy 5.14 considers all public thoroughfares, private roads, and deeded emergency accesses as potential evacuation routes, and identifies “Pre-designated Emergency Evacuation Routes”. Policy 5.15 identifies Tsunami Evacuation Routes as any route in an incorporated or unincorporated area leading inland away from the coastline to higher elevations.

Area Plan Policies

The Area Plans contain policies related to emergency vehicle response. The Area Plan policies and mitigations would supplement those contained in the General Plan, consistent with the 2007 General Plan.

Carmel Valley Master Plan

The Carmel Valley Master Plan Policy 4.4 requires secondary emergency road connections for emergency access to mitigate impact of traffic congestion on emergency response.

Significance Determination

Development of the land uses allowed under the 2007 General Plan under Existing plus Project Development to the Year 2030 would result in inadequate emergency access due to increases in traffic that result in County and Regional roadways exceeding County LOS standards, and creating traffic congestion that slows emergency response time.

The General Plan policies discussed above address transportation related impacts to emergency response due to congestion, and design. However, even with the adoption of county and regional impact fees, and implementation of proposed transportation improvements at the County and Regional level, traffic impacts to County and Regional roadway level of service will remain significant and unavoidable, and thereby cause an impact to emergency response that significant and unavoidable.

Mitigation Measures

As stated in the Roadway Level of Service impacts discussion above, mitigation of LOS impacts would require a substantial number of County and Regional roadway widening and intersection modifications to provide enough capacity to achieve the County's LOS D standard on all impacted segments. Many of the mitigations for these roadways segments are infeasible due to physical, topographical, and environmental constraints, as well the social and economic impacts related to the acquisition of commercial and residential property, or loss of access, for roadway capacity-enhancing projects. The foremost constraint, however, is funding of transportation facilities. The County and TAMC are planning to implement Traffic Impact Fees to fund improvement projects, but the amount of the fees are limited for affordability, and total fee burden. Therefore, no mitigation that improves the LOS on all County and Regional roadways is feasible.

Mitigation Measure TRAN-1E: New Policy C-X.XX on increasing roadway connectivity to enhance emergency access.

C-X.XX: Emergency Response Routes and Street Connectivity Plans. The County shall review Community Area and Rural Center Plans, and new development proposals for roadway connectivity that provides multiple routes for emergency response vehicles. At the time of their update, Community Area and Rural Center Plans shall identify primary and secondary response routes. Secondary response routes shall be required to accommodate through traffic and may be existing roads, or

may be new roads required as part of development proposals. The emergency route and connectivity plans shall be coordinated with the appropriate Fire District.

Significance Conclusion

The development allowed in the 2007 General Plan would generate traffic that would cause County and Regional roadways to exceed the County's LOS D standard, and contribute to roadways that exceed the standard without development, causing traffic congestion that would impact emergency response time. This is a significant and unavoidable impact.

Alternative Transportation

Impact TRAN 1-F: Development allowed under the 2007 General Plan would conflict with adopted policies, plans, or programs supporting alternative transportation or generate pedestrian, bicycle, or transit travel demand that would not be accommodated by current pedestrian facilities, bicycle development plans, or long-range transit plans. (Less than Significant)

Impact of Development with Policies

Development under the 2007 General Plan would be concentrated in Community Areas, Rural Centers, and Affordable Housing Opportunity overlays. The land uses and the design of sites and neighborhoods in these areas would be compatible with alternatives to the automobile (e.g., walking, biking and transit) due to size and residential density.

Bicycling, walking, and transit are less attractive alternatives to the automobile when greater distances are involved. Further, lower density development spread over a larger area is effective to serve by transit than higher density, mixed-use communities. The 2007 General Plan allows for a combination of low density spread development patterns and higher density mixed-use development in central locations. Through the policies established in the General Plan, either type of development would design for, and encourage walking and bicycling, and transit use to the extent transit service is provided. This is a less than significant impact.

2007 General Plan Policies

The 2007 General Plan contains policies to encourage alternate modes of travel by providing transit service, pedestrian and bicycle infrastructure and compact, mixed-use development.

Circulation Element

Many of the policies in the circulation element "encourage" shifts to alternate modes of travel (Policies 2.1, 2.2, 2.5, 3.5, 4.3), but some policies require infrastructure and site design that supports transportation choice. Policy 2.7 requires that new development be located and designed with convenient access and efficient transportation for all intended users, and where possible consider alternative transportation modes. This policy ensures that new development provides multimodal facilities so that walking, bicycling and transit are viable options.

Additional infrastructure related policies include Policy 4.4 which considers abandonment of County roads for public uses of the rights-of-way, such as bikeways, or horseback riding and hiking trails. Policy 4.5 requires that new public local and collector roads be designed to discourage through auto traffic and provide for bicycle and pedestrian traffic within the right-of-way. Policy 4.7 requires, where appropriate and sufficient public right-of-way is available, that bicycle paths shall be separated from major roads and highways and be provided between adjacent communities. Policy 4.9 requires that the County to monitor key County-maintained roadways, intersections, bikeways, and pedestrian facilities to observe and analyze the functioning of these roadways, as well as to identify capacity and safety concerns. This policy is important in ensuring adequate multimodal facilities.

Provision of public transportation service is outside the authority of the County, but the provision of infrastructure and facilities, and transit-supportive land use patterns is established by the County. Policies 6.1, 6.2, 6.5, 6.7, 6.8, and 6.9 provide support and encouragement for public transportation services. Policy 6.3 supports the concentration of new development along major transportation corridors and near incorporated cities to make transit services to these areas more feasible. Policy 6.6 requires transit and bus parking facilities at major hotels, motels, convention centers, other tourist-serving areas and events.

The County's policies support rail transportation with the following. Policy 8.1 makes protection of future rail transportation a high priority. This policy would protect existing railroad right-of-way and support acquisition of railroad corridors for inter-city service. Policy 8.3 supports the planning and implementation of passenger rail, light rail, or bus rapid transit service to urban centers, and Policy 8.4 supports and encourages transit-oriented development around existing and future rail, light rail, or bus rapid transit stations.

Bicycle transportation is supported through the following policies. Policy 10.1 requires the establishment of an integrated system of

bicycle routes for Monterey, developed through a comprehensive bicycle plan coordinated private and public interests and agencies (Policy 10.2). Policy 10.3 requires consideration of bike routes in the construction or expansion of roadways within major transportation corridors. Policies 10.4 through 10.7 support bicycle transportation through multimodal and inter-modal integration, and for visitor serving areas.

Land Use Element

Land Use Element Policies 1.2 and 1.3, encourage managing growth in unincorporated areas and discouraging scattered development to minimize the duration of trips, which also supports alternative modes of transportation. Policies 1.4 and 1.7 requires development to occur only when adequate transportation facilities exist and to encourage phasing and clustering of development to provide for adequate long-range planning of infrastructure, including pedestrian, bicycle and transit facilities. Policies 2.15, 2.17, and 2.21 encourage directing growth to urban and community areas, which better supports transit use. These policies also encourage mixed-use development, which generates fewer vehicle trips by clustering uses together.

Open Space and Conservation Element

Open Space Element Policies10.2 and 10.5 encourages alternative modes of travel and encourage mixed land uses to reduce vehicular travel and minimize negative impact on LOS.

Area Plan Policies

The Area Plans contain policies related to alternative modes of travel and associated supportive land uses. The Area Plan policies and mitigations would supplement those contained in the General Plan, consistent with the 2007 General Plan.

Greater Monterey Master Plan

The Greater Monterey Master Plan Policies 2.7 and 2.9 encourage new development to incorporate designs and location for transit and bicycle and pedestrian connections and for new or expanded arterials or highways to accommodate separated bicycle paths.

Carmel Valley Master Plan

Carmel Valley Master Plan policies 2.1 through 2.5, and 2.15 promote alternative modes of transportation by requiring new development and new facilities to provide for transit stops, bicycle and pedestrian infrastructure.

Toro Area Plan

The Toro Area Plan policies 2.3, 2.4, 2.6, 2.9, and 2.10 provide for additional transit, bicycle and pedestrian infrastructure along new facilities and in new development. Policy 2.10 encourages a study to determine how to increase access to public transit in specific areas.

Cachagua Area Plan

The Cachagua Area Plan policy 2.1 promotes the safety of bicyclists and pedestrians by providing appropriate paving markings.

Significance Determination

Implementation of the policies in the General Plan and Area Plans for development of the land uses allowed under the Existing plus Project Development to the year 2030 would increase pedestrian, bicycle and transit-supportive facilities by both requiring and encouraging the construction of such facilities and land use patterns in new development. These policies provide support for, and do not conflict with, alternative modes of transportation. The transit-supportive land uses identified in the general Plan are consistent with MST's objective to provide transit-oriented development (Designing for Transit: A Manual for Integrating Public Transit and Land Use in Monterey County, MST, 2006).

The land uses allowed under the General Plan, if consistent with policy, would increase the need for transit service with concentrations of development in existing transit-served corridors, community areas, and near incorporated cities. The transit-supportive The increase in demand for transit service is consistent with MST's strategic goals of increasing transit ridership, expanding service, and introducing new services such as BRT in major corridors (Peninsula Area Service Study, 2006 and Business Plan and Short Range Transit Plan, FY 2008 through 2008). Therefore, this impact is less than significant.

Mitigation Measures

No mitigation measures are necessary.

Significance Conclusion

The policies contained in the General Plan provide both requirements and encouragement of alternative mode infrastructure and facilities, and promote transit-support land use patterns. These polices support and do not conflict with existing facilities, policies, plans and programs. The development allowed under the General Plan will generate demand for pedestrian and bicycle facilities, and demand for transit services. These demands can be accommodated by ensuring development conforms to County policies and

design standards, and are consistent with the goals and strategies of MST, the County's transit service provider. This is a less than significant impact.

Year 2030 Cumulative plus Project

Year 2030 Cumulative Conditions represent forecast year 2030 conditions with implementation of the 2007 General Plan development through 2030 plus development of incorporated Cities through 2030. Cumulative development also includes forecasts of development through the year 2030 in Santa Cruz, San Benito and portions of Santa Clara counties. The transportation network in this scenario includes the TAMC Regional Traffic Impact Fee Program projects and proposed County improvement projects described earlier.

This scenario identifies the impacts of development in unincorporated areas of the County cumulative with development in incorporated areas and adjacent counties by identifying changes in roadway level of service. This analysis of the 2007 General Plan is compared to No Project conditions under the 1982 General Plan.

Because there is no version of the AMBAG model that represents the year 2030 under the 1982 General Plan, the Project is compared to the No Project scenario by comparing the amount of housing, population and employment allowed under each scenario, and indicating whether the impacts of the 2007 General Plan would be greater than, less than, or equal to impacts under the 1982 General Plan.

Project-Specific Impacts of the Development under 2030 Cumulative plus Project Conditions

Impact TRAN-2A: Development allowed under the 2007 General Plan cumulatively with other development to the year 2030 would cause project-specific impacts on County roadways which would cause roadways to fall below the acceptable LOS standard D. (Less Than Significant Impact).

Impact of Development with Policies

Project-specific impacts of new development are described in Impact TRAN-1A. These are localized impacts that affect the immediate surrounding transportation system, including access and circulation necessary for the development to function properly and safely. Some project-specific impacts are exclusively attributable to the development such as access connections between the development site and public roadway system. Other project-specific impacts such as impacts to the public roadway system in the immediate vicinity of the development site are cumulative with other development in the area.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Existing plus Project Buildout scenario.

Significance Determination

Project-specific impacts of new development will continue to occur through buildout of the General Plan. As long as General Plan policies remain in effect, new development will be required to prepare a project-level traffic study, or project-level Environmental Impact Report. Impacts to roadway LOS or project access would be identified in these studies and development would be fully responsible for the implementation of mitigation measures or would be responsible for its fair-share of the mitigation depending on the extent of the impact and the development's contribution to the impact along with other cumulative development. If a roadway already falls below the County's LOS standard, then the development is required to mitigate its impact so that the measure of performance (e.g., volume to capacity ratio, peak hour average delay, etc.) of the roadway does not degrade beyond the level without the development. This is a less than significant impact.

Mitigation Measures

Impacts are less than significant, therefore no mitigation is necessary.

Significance Conclusion

Implementation of the 2007 General Plan consistent with policies related to project-specific localized impacts (Policy C-1.4, new development is required to mitigate project-specific local impacts to maintain the County's LOS standard and to provide adequate access and circulation facilities. Policy C-1.3 restricts new development or requires the phasing of new development so that it is concurrent with transportation improvements) would have a less than significant impact and no mitigation is required.

County and Regional Roadway Level of Service Impacts (2030 Cumulative plus Project)

Impact TRAN-2B: Development of the land uses allowed under the 2007 General Plan cumulatively with development in incorporated cities and in adjacent counties would create *traffic increases on* County and Regional roadways which would cause the LOS to exceed the LOS D standard, or contribute traffic to County and Regional roads that exceed the LOS standard without development. (Significant and unavoidable impact)

Impact of Development with Policies

The LOS on study area roadways for the 2030 Cumulative plus Project scenario is illustrated graphically in Exhibit 4.6.8. A detailed analysis of roadway level of service by segment is included in the Appendix.

Table 4.6-16 shows the roadway segments operating at deficient level of service under this scenario and compares the segments to their LOS under existing conditions. As shown in Table 4.6-16, there are 5 segments that operate at LOS E and 29 segments that operate at LOS F in this scenario. There are 5 segments that operate at LOS D in Carmel Valley Area Plan where the standard has been established as a LOS C. In comparison, under existing conditions, 17 of the segments in Table 4.6-17 currently operate at LOS E or F. The development in the County up to the year 2030, cumulatively with other development, causes an additional 17 roadway segments to exceed the county's LOS threshold. In the CVMP area, the development in the County up to the year 2030, cumulatively with other development, causes an additional two roadway segments to exceed the county's LOS threshold as defined in the CVMP. Further discussion of impacts of the 2007 General Plan within the Carmel Valley Plan Area are discussed in the next section.

Table 4.6-17. County Roadway Segments Operating at LOS E or F under 2030 Cumulative plus Project Conditions Roadway Segment

		Existing Conditions (2008)		Cumulative + Project 2030	
		V/C Ratio	LOS	V/C Ratio	LOS
Roadway Segments Operating at LOS F in the 2030 Cumulative plus Project Conditions Scenario					
County Road G12 (Elkhorn Rd)	Salinas Rd to Hall Rd	1.339	F	1.155	F
County Road G12 (Hall Rd)	Elkhorn Rd to San Miguel Canyon Rd	1.879	F	2.575	F
County Road G12 (San Miguel Canyon	Hall Rd to Strawberry Rd	1.122	F	1.252	F

		Existing Conditions (2008)		Cumulative + Project 2030	
		V/C Ratio	LOS	V/C Ratio	LOS
Rd)					
County Road G12 (San Miguel Canyon Rd)	Strawberry Rd to Castroville Blvd	1.485	F	1.460	F
County Road G12(San Miguel Canyon Rd)	Castroville Blvd to US-101	1.486	F	1.362	F
County Road G14 (Jolon Rd/Interlake Rd)	US-101 to San Lucas Rd	0.582	D	1.075	F
Abbott St	SH 101 to Salinas City Line	0.896	E	1.350	F
Blanco Rd	Reservation Rd to Cooper Rd	2.033	F	2.667	F
Blanco Rd	Cooper Rd to Armstrong Rd	2.146	F	2.500	F
Blanco Rd	Armstrong Rd to Davis Rd	2.292	F	2.650	F
Carpenter St	Serra Ave to SR-1	1.354	F	1.383	F
Carpenteria Rd	San Juan Rd to County Border	0.462	C	1.079	F
Corral De Tierra	SH-68 to Robley Rd	0.682	D	1.010	F
Crazy Horse Canyon Rd	San Juan Grade Rd to US-101	0.449	C	1.077	F
Grant St	Payson Rd to Scott St	0.505	D	2.146	F
Grant St	Scott St to Clay St	0.547	D	2.323	F
Harris Rd	Spreckels Blvd to Abbott St	0.844	E	1.490	F
Hebert Rd	San Juan Grade Rd to Old Stage Rd	0.443	D	1.142	F
Ocean Ave	Carmel City Line to SR-1	1.229	F	1.375	F
Old Stage Rd	Hebert Rd to Natividad Rd	0.488	D	1.133	F
Old Stage Rd	Natividad Rd to Williams Rd	0.163	C	1.062	F
Pine Canyon Rd (King City)	Merrit St to Jolon Rd	0.583	D	1.615	F
Porter Dr	Salinas Rd to San Juan Rd	0.967	E	1.425	F
Porter Dr	San Juan Rd to Santa Cruz County Line	1.423	F	2.558	F
Prunedale North Rd	SR-156 to San Miguel Canyon	0.458	D	1.406	F
Rio Rd	Carmel City Line to SR-1	1.161	F	1.719	F
Russell Rd	SR-101 to San Juan Grade	0.661	D	1.302	F

		Existing Conditions (2008)		Cumulative + Project 2030	
		V/C Ratio	LOS	V/C Ratio	LOS
	Rd				
San Juan Grade Rd	Salinas City Line to Russell Rd	1.015	F	1.042	F
San Juan Grade Rd	Russell Rd to Rogge Rd	0.747	D	1.058	F
Roadway Segments Operating at LOS E in the 2030 Cumulative plus Project Conditions Scenario					
County Road G12 (Salinas)	Railroad Ave to Elkhorn Rd	0.584	D	0.964	E
Carpenter St	Carmel City Line to Serra Ave	0.828	E	0.906	E
Rogge Rd	San Juan Grade Rd to Natividad Rd	0.661	D	0.979	E
Salinas Rd	Fruitland Ave to Elkhorn Rd	0.499	C	0.967	E
San Miguel Canyon Rd	Tarpey Rd to Hall Rd	0.525	D	0.983	E
Roadway Segments Operating at Deficient LOS D in the 2030 Cumulative plus Project Conditions Scenario					
County Road G20 (Laureles Grade Rd)	Robley Rd to Carmel Valley Rd	0.582	D	0.788	D
Carmel Rancho Blvd	Carmel Valley Blvd to Carmel Rancho Ln	0.619	D	0.679	D
Carmel Rancho Blvd	Carmel Rancho Ln to Rio Rd	0.402	C	0.479	D
Rio Rd	SR-1 to Carmel Rancho Blvd	0.575	D	0.625	D

Source: Kimley-Horn and Associates, Inc.

Impact of Development in the Carmel Valley Area Plan

As described earlier in this chapter, the roadway level of service analysis for the Carmel Valley Master Plan (CVMP) area is based on peak hour (AM and PM peak) information. The reason that CVMP roadway facilities are analyzed in the peak hour as opposed to the daily analysis used for the rest of the County is because it is a more project-specific and accurate method of analysis, the CVMP policies establish LOS standards based on peak hour (CV 2.18(d)), and a recent peak hour draft traffic analysis of the CVMP and the Carmel Valley Transportation Improvement Program was available (CVMP Traffic Study, July 2007). At the project-specific or small planning area level of analysis, a peak hour operational analysis should be used to

overcome the inaccuracies and impact over-estimation characteristic of daily V/C Ratio analysis.

The Area Plan for Carmel Valley specifies an acceptable LOS of "C" or "D" for Carmel Valley Road depending on the roadway segment, as opposed to a LOS "C" that is proposed to be the acceptable level for other Carmel Valley roadways and LOS D in the remainder of the unincorporated County. Integration of this analysis into the 2007 General Plan EIR allows for consistency between documents. For Carmel Valley Road, the following LOS standards apply to its segments:

Segment 1: East of Holman Road (LOS C)

Segment 2: Holman Road to Esquiline Road (LOS C)

Segment 3: Esquiline Road to Ford Road (LOS D)

Segment 4: Ford Road to Laureles Grade (LOS D)

Segment 5: Laureles Grade to Robinson Canyon Road (LOS D)

Segment 6: Robinson Canyon Road to Schulte Road (LOS D)

Segment 7: Schulte Road to Rancho San Carlos Road (LOS D)

Segment 8: Rancho San Carlos Road to Rio Road (LOS C)

Segment 9: Rio Road to Carmel Rancho Boulevard (LOS C)

Segment 10: Carmel Rancho Boulevard to SR1 (LOS C)

Table 4.6-18 presents the peak hour level of service for roadways within the CVMP based on the analyses prepared for the traffic studies referenced above. The modeling for these traffic studies assumed a higher amount of development in the CVMP area in 2030 than the analysis of the rest of the County under the 2030 Cumulative plus Project scenario. The CVMP analysis assumes development of 1,188 housing units between 2000 and 2030, more units than assumed in the General Plan estimates to the year 2030. Although analyzed in Table 4.6-17 Highway 1 (SR 1) is not a part of the CVMP, but a regional road that connects to the CVMP and subject to the County's standard of LOS D. Three segments of Carmel Valley Road exceed their LOS D standard under this scenario.

The General Plan daily analysis in Table 4.6-16 shows three roads exceeding the CVMP LOS standard of "C", County Road G20 (Laureles Grade), Carmel Ranch Boulevard, and Rio Road. The General Plan analysis indicates that these roads are significantly impacted.

Table 4.6-18. Carmel Valley Roadway Level of Service under 2030 Cumulative plus Project Conditions

Roadway	Direction	Level of Service	
		AM Peak	PM Peak
Highway (SR) 1			
between Rio Rd & Carmel Valley Rd	NB	B	B
	SB	E	E
between Carmel Valley Rd & Ocean Ave	NB	C	C
	SB	F	F
between Ocean Ave & Carpenter St	NB	D	D
	SB	C	C
Carmel Valley Road			
East of Holman (Standard LOS C)	BOTH	C	C
Holman Road to Esquiline Road (Standard LOS C)	BOTH	C	C
Esquiline Road to Ford Road (Standard LOS D)	BOTH	D	D
Ford Road to Laureles Grade(Standard LOS D)	BOTH	D	D
Laureles Grade to Robinson Canyon Road(Standard LOS D)	BOTH	E	E
Robinson Canyon Road to Schulte Road (Standard LOS D)	BOTH	E	E
Schulte Road to Rancho San Carlos Road (Standard LOS D)	BOTH	E	E
Rancho San Carlos Road to Rio Road (Standard LOS C)	EB	A	B
	WB	B	B
Rio Road to Carmel Rancho Boulevard (Standard LOS C)	EB	B	C
	WB	C	C
Carmel Rancho Boulevard to Highway 1 (Standard LOS C)	EB	B	B
	WB	C	B

Source: Kimley-Horn & Associates, Inc. 2008 and DKS Associates, 2007.

Table 4.6-19 presents the Regional roadway segments operating at LOS E or LOS F under 2030 Cumulative plus Project conditions and compares the segments to their LOS under existing conditions. Exhibit 4.6.8 presents the segment LOS graphically. A detailed table showing the volume, the volume to capacity ratio and the resulting LOS for each Regional roadway segment is included in the Appendix.

There are six regional roadway segments that operate at LOS E and 64 segments that operate at LOS F under this scenario. Under existing conditions, 47 of these Regional roadway segments operate at LOS E or F, so development in the County up to the year 2030, cumulatively with other development, causes an additional 23 roadway segments to exceed the County's LOS threshold.

Table 4.6-19. Regional Roadway Segments Operating at LOS E or F under 2030 Cumulative plus Project Conditions

		Existing Conditions (2008)		2030 Cumulative plus Project Conditions	
Roadway Segment		V/C Ratio	LOS	V/C Ratio	LOS
Roadway Segments Operating at LOS F in the 2030 Cumulative plus Project Conditions Scenario					
US Highway 101	County Border to Crazy Horse Canyon Rd	1.044	F	1.067	F
US Highway 101	Crazy Horse Canyon Rd to San Miguel Canyon Rd	0.989	E	1.011	F
US Highway 101	San Miguel Canyon Rd to SR-156	1.441	F	1.657	F
US Highway 101	SR-156 to Pesante Rd	1.106	F	1.763	F
US Highway 101	Pesante Rd to Espinosa Rd	1.106	F	1.759	F
US Highway 101	Espinosa Rd to E Boronda Rd	1.098	F	1.503	F
US Highway 101	E Boronda Rd to W Laurel Dr	1.143	F	1.512	F
US Highway 101	W Laurel Dr to N Main St	1.107	F	1.702	F
US Highway 101	N Main St to E Market St	1.172	F	1.583	F
US Highway 101	E Market St to John St	1.114	F	1.566	F
US Highway 101	John St to S Sanborn Rd	0.897	D	1.344	F
US Highway 101	S Sanborn Rd to Airport Blvd	0.745	C	1.120	F
US Highway 101	Airport Blvd to Abbott St	0.615	C	1.190	F
US Highway 101	Chualar Rd to Old Stage Rd	0.654	D	1.312	F
US Highway 101	Old Stage Rd to 5th St	0.646	C	1.357	F
US Highway 101	5th St to S Alta St	0.600	C	1.224	F
US Highway 101	S Alta St to Camphora Rd	0.631	C	1.254	F
US Highway 101	Camphora Rd to Moranda Rd	0.623	C	1.259	F
US Highway 101	Moranda Rd to Front St	0.646	C	1.212	F
US Highway 101	Front St to Arroyo Seco Rd	0.662	C	1.206	F
US Highway 101	Arroyo Seco Rd to El Camino Real	0.592	C	1.069	F

Roadway Segment		Existing Conditions (2008) V/C Ratio	LOS	2030 Cumulative plus Project Conditions V/C Ratio	LOS
SR-1	County Border to Salinas Rd	0.769	D	1.275	F
SR-1	Salinas Rd to Struve Rd	1.546	F	2.137	F
SR-1	Struve Rd to Dolan Rd	1.667	F	2.309	F
SR-1	Dolan Rd to Molera Rd	1.496	F	2.108	F
SR-1	Molera Rd to SR-183	1.426	F	1.96	F
SR-1	Canyon del Rey Blvd to Del Monte Ave	1.071	F	1.155	F
SR-1	N Fremont St to Aguajito Rd	1.411	F	1.443	F
SR-68 (Holman Highway)	Forest Ave to 17 Mile Dr	1.448	F	1.681	F
SR-68 (Holman Highway)	17 Mile Dr to Skyline Forest Dr	1.638	F	1.908	F
SR-68 (Holman Highway)	Skyline Forest Dr to CHOMP Dwy	1.638	F	1.908	F
SR-68 (Monterey Salinas Highway)	SR-1 to Olmsted Rd	1.422	F	1.529	F
SR-68 (Monterey Salinas Highway)	Olmsted Rd to Canyon del Rey Blvd	1.422	F	1.575	F
SR-68 (Monterey Salinas Highway)	Canyon del Rey Blvd to Bit Rd	1.304	F	1.509	F
SR-68 (Monterey Salinas Highway)	Bit Rd to Laureles Grade Rd	1.304	F	1.515	F
SR-68 (Monterey Salinas Highway)	Laureles Grade Rd to Corral de Tierra	1.525	F	1.822	F
SR-68 (Monterey Salinas Highway)	Spreckels Blvd to E Blanco Rd	0.811	B	1.026	F
SR-146 (Front St)	US-101 to East St	0.507	D	1.048	F
SR-146 (East St)	Front St to Metz Rd	0.507	D	1.041	F
SR-183 (Castroville Rd)	Blackie Rd to Espinosa Rd	1.074	F	1.577	F
SR-183 (Castroville Rd)	Espinosa Rd to Cooper Rd	1.012	F	1.509	F
SR-218 (Canyon del Rey Blvd)	SR-1 to Del Monte Blvd	0.739	D	1.052	F
SR-218 (Canyon del Rey Blvd)	Fremont Blvd to Carlton Dr	1.099	F	1.295	F
SR-218 (Canyon del Rey Blvd)	Carlton Dr to SR-68	1.099	F	1.336	F
Foam St	Prescott Ave to Drake Ave	1.156	F	1.775	F
Foam St	Drake Ave to Lighthouse Ave	1.277	F	1.688	F
Lighthouse Ave	David Ave to Prescott Ave	1.022	F	1.003	F
Lighthouse Ave	Prescott Ave to Private Bolio Rd	1.637	F	1.785	F
Lighthouse Ave	Private Bolio Rd to Pacific St	1.270	F	1.252	F

Roadway Segment		Existing Conditions (2008) V/C Ratio	LOS	2030 Cumulative plus Project Conditions V/C Ratio	LOS
Lighthouse Ave	Pacific St to Washington St	1.124	F	1.126	F
Del Monte Ave	Washington St to Camino Aguajito	1.314	F	1.162	F
Del Monte Ave	Camino Aguajito to Casa Verde Wy	1.313	F	1.33	F
Del Monte Ave	Casa Verde Wy to SR-1	1.443	F	1.845	F
Fremont St	Abrego St to Camino Aguajito	1.065	F	1.168	F
Munras Ave/Abrego St	Soledad Dr to Via Zaragoza	1.226	F	1.425	F
Del Monte Blvd	SR-1 to Canyon del Rey Blvd	1.039	F	1.243	F
Del Monte Blvd	Canyon del Rey Blvd to Broadway Ave	1.058	F	1.136	F
Del Monte Blvd	SR-1 to Reindollar Ave	1.081	F	1.443	F
Del Monte Blvd	Reindollar Ave to Reservation Rd	1.929	F	2.498	F
N Fremont St	Casa Verde Wy to SR-218	0.971	E	1.058	F
E Boronda Rd	US-101 to N Main St	0.923	D	1.711	F
John St	Abbott St to US-101	1.069	F	1.071	F
Davis Rd	W Laurel Dr to SR-183	1.057	F	1.061	F
Blanco Rd	S Davis Rd to W Alisal St	0.698	D	1.019	F
Roadway Segments Operating at LOS E in the 2030 Cumulative plus Project Conditions Scenario					
US Highway 101	El Camino Real to Oak Ave	0.545	C	0.888	E
SR-1	Aguajito Rd to Munras Ave	0.854	D	0.916	E
SR-1	Holman Hwy to Carpenter St	0.890	D	0.991	E
SR-218 (Canyon del Rey Blvd)	Del Monte Blvd to Fremont Blvd	0.708	D	0.968	E
Fremont Blvd	N Del Monte Blvd to SR-1	0.854	D	0.997	E
Sanborn Rd	US-101 to Abbott St	0.983	E	0.961	E

Source: Kimley-Horn and Associates, Inc.

Table 4.6-20 compares existing and 2030 Cumulative plus Project roadway LOS on Regional roadways external to Monterey County. Traffic generated by the land uses allowed under the 2007 General Plan will produce inter-county travel between housing and jobs in Santa Cruz, San Benito, and Santa

Clara counties, and to a lesser extent San Luis Obispo County. With cumulative development in adjacent counties increases the demand for this inter-county travel. Development allowed under the General Plan, cumulatively with development in incorporated cities in Monterey County and development in adjacent counties, causes nearly every roadway segment to experience an increase in the volume to capacity ratio, and causes four segments to change from LOS D or better to a LOS E or F.

Table 4.6-20. Roadway Level of Service of Facilities External to Monterey County under 2030 Cumulative plus Project Conditions

		Existing Conditions (2008)		2030 Cumulative plus Project Conditions	
Roadway Segment		V/C Ratio	LOS	V/C Ratio	LOS
Santa Clara County					
US Highway 101	Cochrane Rd to E Dunne Ave	1.139	F	2.076	F
US Highway 101	Masten Ave to Leavesley Rd/SR-152 West	0.989	E	1.447	F
US Highway 101	Monterey Rd to SR-25	1.071	F	1.669	F
SR-152	SR-156 to Merced County	0.630	C	1.029	F
Santa Cruz County					
SR-1	Soquel Ave to 41st St	1.368	F	1.560	F
SR-1	Airport Blvd to SR-152	0.876	D	1.297	F
SR-1	Harkings Slough Rd to SR-129	0.608	C	1.042	F
SR-1	SR-129 to Monterey County	0.492	B	0.815	D
SR-17	Santa Clara County to Granite Creek Rd	0.958	E	0.849	D
SR-129 (Riverside Rd)	Lakeview Rd to Carlton Rd	0.847	D	1.190	F
San Benito County					
US Highway 101	Santa Clara County to SR-129	0.912	E	1.282	F
SR-25 (Bolsa Rd)	Santa Clara County to SR-156	1.196	F	1.883	F
SR-156	Salinas Rd to Union Rd	1.706	F	1.785	F
San Luis Obispo County					
US Highway 101	Monterey County to San Miguel Ave	0.300	A	0.512	B

Source: Kimley-Horn and Associates, Inc.

Impact of Goods Movement on Roadway Level of Service

As described earlier, the county's current truck traffic generation is expected to increase from 12,600 truck trips per day (2006) to 18,600 in 2030. This is a cumulative projection, not just trucks generated by land uses in unincorporated Monterey County. This increase in freight movement is not significant enough to cause widespread capacity-related impacts, but will contribute large vehicle traffic to roadways and highways that are currently, or are projected to fall below the County's acceptable LOS standard and may cause the localized impacts on heavily traveled freight routes (e.g., Highways 1, 101, 156, and 183) and within industrialized areas where truck traffic originates see Impact TRAN-1A).

2007 General Plan Policies

The 2007 General Plan policies establish measures to minimize adverse impacts of roadway level of service impacts of development both individually and cumulatively. The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Year 2030 Cumulative plus Project scenario.

Significance Determination

Development and land use allowed under the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would increase traffic volumes on County roads, Regional roads, and regional roads external to the County. This added traffic would both cause roadway segments to exceed the County's LOS standard, and contribute traffic to roadways that exceed the LOS standard without development, and further degrade the performance measure. Within the CVMP, three segments of Carmel Valley Road are projected to exceed LOS standards, but mitigation measures are proposed in the CVMP Traffic study to improve these impacts to less than significant.

Despite development contributions to county impacts (through countywide traffic impact fee), and regional impacts (through regional traffic impact fee) there will remain a funding shortfall for the improvement of County and Regional roads to achieve the County's LOS standard. Therefore this impact remains significant and unavoidable.

Mitigation Measures

Mitigation of the impacts described above to achieve a LOS D include:

- Widening County and Regional roadway from existing 2-lane facilities to4, 6, or 8-lanes facilities;
- Expand existing intersections to include additional through and turning lanes;

- Install traffic signals;
- Grade-separate intersections of the junction between major streets;
- Widen state highway to accommodate additional travel lanes, provide shoulders, and auxiliary lanes between on and off-ramps; and
- Increase public transportation services by expanding MST's fleet, expand fixed-route services, increase headways, provide park and ride facilities, and implement new services including Bus Rapid Transit, and inter-city rail service.

Many of the mitigations for roadways segments are likely infeasible due to physical, topographical, and environmental constraints, as well the social and economic impacts related to the acquisition of commercial and residential property, or loss of access, and lack of community consensus for roadway capacity-enhancing projects. This construction would result in impacts to other resources, such as biological resources, air quality, noise, aesthetics and agricultural lands. The foremost constraint, however, is funding of transportation facilities. Federal, state and regional funding are limited, and most of these funds are used to maintain the transportation system. The County and TAMC are planning to implement Traffic Impact Fees to fund improvement projects, but the amount of the fees are limited for affordability and total fee burden reasons. Further, another source of funding, voter initiatives to increase sales tax to fund transportation projects, have failed recently, but may be an option in the future.

The County and regional fee programs will continuously be updated, adding additional priority projects to the programs as initial projects are completed, but the rate of project completion will not be able to outpace the rate of development growth.

The following mitigation measures are recommended for implementation by the County to achieve LOS standards within the CVMP area.

Mitigation Measure TRAN-2B: Revise policies in the Carmel Valley Master Plan as follows:

Policy CV-2.10

The following are policies regarding improvements to specific portions of Carmel Valley Road:

a) Via Petra to Robinson Canyon Road

Every effort should be made to preserve its rural character by maintaining it as a 2-lane road with paved shoulders, passing lanes and left turn channelizations at intersections where warranted.

b) Robinson Canyon Road to Laureles Grade

Every effort should be made to preserve its rural character by maintaining it as a 2-lane road with paved shoulders, passing lanes and left turn channelizations at intersections where warranted.

c) Carmel Valley Road/Laureles Grade

A grade separation should be constructed at this location instead of a traffic signal. The grade separation needs to be constructed in a manner that minimizes impacts to the rural character of the road. An interim improvement of an all-way stop or stop signal is allowable during the period necessary to secure funding for the grade separation.

d) Laureles Grade to Ford Road

Shoulder improvements and widening should be undertaken here and extended to Pilot Road, and include left turn channelization at intersections as warranted.

e) East of Esquiline Road

Shoulder improvements should be undertaken at the sharper curves. Curves should be examined for spot realignment needs.

f) Laureles Grade improvements

Improvements to Laureles Grade should consist of the construction of shoulder widening, spot realignments, passing lanes and/or paved turn-outs. Heavy vehicles should be discouraged from using this route.

Policy CV-2.12:

To accommodate existing and future traffic, the following road improvements are recommended:

Add a northbound climbing lane between Rio Road and Carmel Valley Road:

a) Laureles Grade - undertake shoulder improvements, widening and spot realignment;
b) Carmel Valley Road, Robinson Canyon Road to Ford Road - add left turn channelization at all intersections. Shoulder improvements should be undertaken.

Policy CV-2.18 :

To implement traffic standards to provide adequate streets and highways in Carmel Valley, the County shall conduct and implement the following:

a) Twice yearly monitoring by Public Works (in June and October) of peak hour traffic at the following 12 locations:

Carmel Valley Road

1. East of Holman Road
2. Holman Road to Esquiline Road
3. Esquiline Road to Ford Road
4. Ford Road to Laureles Grade
5. Laureles Grade to Robinson Canyon Road
6. Robinson Canyon Road to Schulte Road
7. Schulte Road to Rancho San Carlos Road
8. Rancho San Carlos Road to Rio Road
9. Rio Road to Carmel Rancho Boulevard
10. Carmel Rancho Boulevard to SR1

Other Locations

11. Carmel Rancho Boulevard between Carmel Valley Road and Rio Road
12. Rio Road between its eastern terminus and SR1

b) A yearly evaluation report (December) shall be prepared jointly by the Public Works and Planning Departments and shall evaluate the peak-hour level of service (LOS) for these 12 locations to indicate segments approaching a traffic volume which would lower levels of service below the LOS standards established below under CV 2-18(d).

c) Public hearings shall be held in January immediately following a December report in (b) above in which only 100 or less peak hour trips remain before an unacceptable level of service (as defined by CV 2-18(d)) would be reached for any of the 12 segments described above.

d) The traffic LOS standards (measured for peak hour conditions) for the CVMP Area shall be as follows:

1. Signalized Intersections – LOS of "C" is the acceptable condition.
2. Unsignalized Intersections – LOS of "F" or meeting of any traffic signal warrant are defined as unacceptable conditions
3. Carmel Valley Road Segment Operations:
   a. LOS of "C" for Segments 1, 2, 8, 9, and 10 is an acceptable condition;
   b. LOS of "D" for Segments 3, 4, 5, 6, and 7 is an acceptable condition.

During review of development applications which require a discretionary permit, if traffic analysis of the proposed project indicates that the project would result in traffic conditions that would exceed the standards

described above in CV 2-18(d) after the analysis takes into consideration the Carmel Valley Traffic Improvement Program to be funded by the Carmel Valley Road Traffic Mitigation Fee, then approval of the project shall be conditioned on the prior (e.g., prior to project-generated traffic) construction of additional roadway improvements OR an Environmental Impact Report shall be prepared for the project. Such additional roadway improvements must be sufficient, when combined with the projects programmed in the Carmel Valley Traffic Improvement Program, to allow County to find that the affected roadway segments or intersections would meet the acceptable standard upon completion of the programmed plus additional improvements. This policy does not apply to the first single-family residence on a legal lot of record.

Policy CV-2.19:

Carmel Valley Traffic Improvement Program (CVTIP)

a) The CVTIP shall include the following projects (unless a subsequent traffic analysis identifies that different projects are necessary to maintain the LOS standards in Policy CV-2.18(d):

    1. Left-turn channelization on Carmel Valley Road west of Ford Road;
    2. Shoulder widening on Carmel Valley Road between Laureles Grade and Ford Road;
    3. Paved turnouts, new signage, shoulder improvements, and spot realignments on Laureles Grade;
    4. Grade separation at Laureles Grade and Carmel Valley Road (an interim improvement of an all-way stop or stop signal is allowable during the period necessary to secure funding for the grade separation);
    5. Sight Distance Improvement at Dorris Road;
    6. Passing lanes in front of the proposed September Ranch development;
    7. Passing lanes opposite Garland Park;
    8. Climbing Lane on Laureles Grade;
    9. Upgrade all new road improvements within Carmel Valley Road Corridor to Class 2 bike lanes;
    10. Passing lane (1/4 mile) between Schulte Road and Robinson Canyon Road; and
    11. Passing lane (1/4 mile) between Rancho San Carlos Rd and Schulte Road.

b) The County shall adopt an updated fee program to fund the CVTIP.

c) All projects within the CVMP area and within the "Expanded Area" that contribute to traffic within the CVMP area shall contribute fair-

share traffic impact fees to fund necessary improvements identified in the CVTIP, as updated at the time of building permit issuance.

d) Where conditions are projected to approach unacceptable conditions (as defined by the monitoring and standards described above under CV 2-18(d)), the CVTIP shall be updated to plan for and fund adequate improvements to maintain acceptable conditions.

Significance Conclusion

With buildout of the 2007 General Plan, and implementation of mitigation measures determined to be feasible, there would remain significant and unavoidable impacts on County roads, and Regional roads both within and external to Monterey County.

A traffic study of the CVMP has identified impacts and mitigation measures for Carmel Valley Road (described above). These mitigation measures result in impacts to Carmel Valley Road being less than significant except for the segment of Carmel Valley Road in the Carmel Valley Village where the conditions will drop from LOS C (the current standard) to LOS D (the proposed standard) due to the lack of feasible mitigation consistent with the rural character of Carmel Valley to maintain the higher standard.

A traffic study (Kimley-Horn 2008) of SR-1 operations between Rio Road and Ocean Blvd has identified significant existing and cumulative impacts that can only be fully mitigated with widening to 4-lanes along this segment. As this is mostly an existing problem, there are limitations on the use of new development fees to pay to correct an existing problem. Neither TAMC nor Caltrans is currently planning to fund SR-1 widening at this location. Further, there is no community consensus to complete a widening project. Thus, widening of this segment is considered infeasible due to the lack of available funding and a lack of community support and thus impacts to SR-1 between Rio Road and Ocean Boulevard to be significant and unavoidable.

Air Traffic

Impact TRAN-2C: Growth in land uses allowed under the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would increase demand for air travel at the County's four airports or increase development within the approach and departure pattern of airports.

Impact of Development with Policies

The discussion of air traffic impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Year 2030 Cumulative plus Project scenario.

Significance Determination

Development of the land uses allowed under the 2007 General Plan by the year 2030 would result in an increase in demand for air travel. Passenger travel in Monterey County peaked in 1978 with about 640,000 passengers annually. Since that time passenger travel has declined to nearly half of its peak (Monterey Airport District, 2008). Without adding additional capacity at airports, the current passenger level could increase to at least 640,000 passengers annually without impacting airport operations (a 96% increase).

Land use growth proposed in the general Plan and specifically the Hwy 68/Monterey Peninsula Airport Affordable Housing Overlay will not be located within airport flight paths, and will not be design in such a way as to become an incompatible land use (i.e., high rise buildings). No change in airport location is being proposed in the 2007 General Plan. (Less than Significant Impact).

Mitigation Measures

Impacts would be less than significant, therefore no mitigation measures are necessary.

Significance Conclusion

The development of the General Plan would increase the demand for the air travel. The General Plan contains policies to encourage safe operations of air facilities and land uses surrounding the airports that are consistent with airport operations. Airport passenger demand is significantly less than it was in 1978 and therefore can accommodate substantial increases without increasing the capacity of airports. Impacts of the General Plan policies under 2030 Cumulative plus Project are less than significant.

Roadway Hazards

Impact TRAN-2D: Growth in land uses allowed under the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would result in non-standard or hazardous designs or land uses that are incompatible with public facilities and adjoining land uses. (Less Than Significant)

Impact of Development with Policies

The discussion of roadway hazard impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Year 2030 Cumulative plus Project scenario.

Significance Determination

Development of the land uses allowed under the 2007 General Plan by the year 2030 would result in non-standard or hazardous designs and incompatible facilities with adjoining land uses. The General Plan provides for policies to prevent or reduce these impacts by requiring roads to be designed to safety standards. These policies require new development to design facilities to County standards. They also provide for road safety programs (signing, marking, and improved sight distance) to improve overall safety. The 2007 General Plan also has policies to limit incompatible land uses. Therefore, the impact of roadway hazards with implementation the 2007 General Plan is less than significant.

Mitigation Measures

No additional mitigation measures beyond the 2007 General Plan are necessary.

Significance Conclusion

The development under the General Plan would result in non-standard or hazardous transportation facility designs or land uses that are incompatible with public facilities. However, the 2007 General Plan contains policies to ensure that new development provides access and improvements to the county roadway system to meet County standards. It also contains policies to prevent incompatible land uses to avoid transportation conflicts and roadway hazards. Therefore, the impact is less than significant.

Emergency Access

Impact TRAN-2E: Growth in land uses allowed under the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would result in inadequate emergency access. (Significant and Unavoidable)

Impact of Development with Policies

The discussion of emergency access impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Year 2030 Cumulative plus Project scenario.

Significance Determination

Development of the land uses allowed under the 2007 General Plan under 2030 Cumulative plus Project would result in inadequate emergency access due to increases in traffic that result in County and Regional roadways exceeding County LOS standards, and creating traffic congestion that slows emergency response time.

The General Plan policies discussed above address transportation related impacts to emergency response due to congestion, and design. However, even with the adoption of county and regional impact fees, and implementation of proposed transportation improvements at the County and Regional level, traffic impacts to County and Regional roadway level of service will remain significant and unavoidable, and thereby cause an impact to emergency response that significant and unavoidable.

Mitigation Measures

The mitigation measures described under the Existing plus Project Development to the Year 2030 (MM-2E) are applicable to this scenario.

Significance Conclusion

The development allowed in the 2007 General Plan would generate traffic that would cause County and Regional roadways to exceed the County's LOS D standard, and contribute to roadways that exceed the standard without development, causing traffic congestion that would impact emergency response time. Although mitigation is proposed to identify and expand emergency response routes and increased road connectivity within new

developments, this measure does not mitigate LOS impacts. This is a significant and unavoidable impact.

Alternative Transportation

Impact TRAN-2F: Development allowed under the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would conflict with adopted policies, plans, or programs supporting alternative transportation or generate pedestrian, bicycle, or transit travel demand that would not be accommodated by current pedestrian facilities, bicycle development plans, or long-range transit plans. (Less than Significant)

Impact of Development with Policies

The discussion of air traffic impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Year 2030 Cumulative plus Project scenario.

Significance Determination

Implementation of the policies in the General Plan and Area Plans for development of the land uses allowed under the 2030 Cumulative plus Project scenario would increase pedestrian, bicycle and transit-supportive facilities by both requiring and encouraging the construction of such facilities and land use patterns in new development. These policies provide support for, and do not conflict with, alternative modes of transportation. The transit-supportive land uses identified in the general Plan are consistent with MST's objective to provide transit-oriented development (Designing for Transit - A Manual for Integrating Public Transit and Land Use in Monterey County, MST, 2006).

The land uses allowed under the General Plan, if consistent with policy, would increase the need for transit service with concentrations of development in existing transit-served corridors, community areas, and near incorporated cities. The increase in demand for transit service is consistent with MST's strategic goals of increasing transit ridership, expanding service, and introducing new services such as BRT in major corridors (Peninsula Area Service Study, 2006 and Business Plan and Short Range Transit Plan, FY 2008 through 2008). Therefore, this impact is less than significant.

Mitigation Measures

No mitigation measures are necessary.

Significance Conclusion

The policies contained in the General Plan provide both requirements and encouragement of alternative mode infrastructure and facilities, and promote transit-support land use patterns. These polices support and do not conflict with existing facilities, policies, plans and programs. The development allowed under the General Plan will generate demand for pedestrian and bicycle facilities, and demand for transit services. These demands can be accommodated by ensuring development conforms to County policies and design standards, and are consistent with the goals and strategies of MST, the County's transit service provider. This is a less than significant impact.

Existing plus Project (Buildout of the General Plan)

Buildout of the General Plan represents the combination of existing conditions and forecast 2007 General Plan buildout development within unincorporated Monterey County. The number of potential housing units to be added to unincorporated Monterey County was determined from the number of vacant residential lots and the assigned zoning within each planning area or community area. Employment was derived based on the rate of growth in housing units and population by maintaining the employee per housing unit ratio contained in the 2030 AMBAG model constant. At the annual rate of residential growth derived from the AMBAG 2004 forecasts, buildout of the 2007 General Plan is estimated to occur in the year 2092.

This scenario identifies the impacts of development in unincorporated areas of the County assuming no development in incorporated areas and adjacent counties.

Project-Specific Impacts of the Development under Existing plus Project Buildout

Impact TRAN-3A: Buildout of the 2007 General Plan would cause project-specific impacts on County roadways which would cause roadways to fall below the acceptable LOS standard D. (Less Than Significant Impact).

Impact of Development with Policies

Project-specific impacts of new development are described in Impact TRAN-1A. These are localized impacts that affect the immediate surrounding transportation system, including access and circulation necessary for the

development to function properly and safely. Some project-specific impacts are exclusively attributable to the development such as access connections between the development site and public roadway system. Other project-specific impacts such as impacts to the public roadway system in the immediate vicinity of the development site are cumulative with other development in the area.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Existing plus Project Buildout scenario.

Significance Determination

Project-specific impacts of new development will continue to occur through buildout of the General Plan. As long as General Plan policies remain in effect, new development will be required to prepare a project-level traffic study, or project-level Environmental Impact Report. Impacts to roadway LOS or project access would be identified in these studies and development would be fully responsible for the implementation of mitigation measures or would be responsible for its fair-share of the mitigation depending on the extent of the impact and the development's contribution to the impact along with other cumulative development. If a roadway already falls below the County's LOS standard, then the development is required to mitigate its impact so that the measure of performance (e.g., volume to capacity ratio, peak hour average delay, etc.) of the roadway does not degrade beyond the level without the development. This is a less than significant impact.

Mitigation Measures

Impacts are less than significant, therefore no mitigation is necessary.

Significance Conclusion

Implementation of the 2007 General Plan consistent with policies related to project-specific localized impacts (Policy C-1.4, new development is required to mitigate project-specific local impacts to maintain the County's LOS standard and to provide adequate access and circulation facilities. Policy C-1.3 restricts new development or requires the phasing of new development so that it is concurrent with transportation improvements) would have a less than significant impact and no mitigation is required.

County and Regional Roadway Level of Service Impacts (Existing plus Project Buildout)

Impact TRAN-3B: Buildout of the 2007 General Plan would *increase traffic on* County and Regional roadways which would cause the LOS to exceed the LOS D standard, or contribute traffic to County and Regional roads that exceed the LOS standard without development. (Significant and unavoidable impact)

Impact of Development with Policies

The LOS on study area roadways for the Existing plus Project Buildout scenario is illustrated graphically in Exhibit 4.6.9. A detailed analysis of roadway level of service by segment is included in the Appendix.

Table 4.6-21 shows the roadway segments operating at deficient level of service under this scenario and compares the segments to their LOS under existing conditions. As shown in Table 4.6-21, there are 4 segments that operate at LOS E and 39 segments that operate at LOS F in this scenario. Segments of Carmel Valley Road between SR 1 and Ford Road in the CVMP area are projected to operate at LOS F at buildout of the General Plan. Carmel Valley Road segments between Ford Road and Via Los Tulares will operate at LOS D, exceeding the CVMP LOS standard of LOS C.

In comparison, under existing conditions, 28 of the segments in Table 4.6-21 currently operate at LOS E or F. The development in the County at buildout causes an additional 16 roadway segments to exceed the county's LOS threshold. In the CVMP area, the development in the County up to the year 2030, cumulatively with other development, causes an additional two roadway segments to exceed the county's LOS threshold as defined in the CVMP. Further discussion of impacts of the 2007 General Plan within the Carmel Valley Plan Area are discussed in the next section.

Table 4.6-21. County Roadway Segments Operating at LOS E or F under Existing plus Project Buildout Conditions

Roadway Segment		Existing Conditions		Existing plus Project Buildout Conditions	
		V/C Ratio	LOS	V/C Ratio	LOS
Roadway Segments Operating at LOS F in the Existing plus Project Buildout Scenario					
County Road G11 (San Juan Rd)	Salinas Rd to San Miguel Canyon Rd	0.942	E	1.447	F
County Road G11 (San Juan Rd)	Aromas Rd to Carpenteria Rd	0.938	E	1.173	F
County Road G12 (Salinas)	Porter Dr to Railroad Ave	1.236	F	1.514	F
County Road G12 (Elkhorn Rd)	Salinas Rd to Hall Rd	1.339	F	1.418	F
County Road G12 (Hall Rd)	Elkhorn Rd to San Miguel Canyon Rd	1.879	F	1.935	F
County Road G12 (San Miguel Canyon Rd)	Strawberry Rd to Castroville Blvd	1.485	F	1.404	F
County Road G12 (San Miguel Canyon Rd)	Castroville Blvd to US-101	1.486	F	1.267	F
County Road G14 (Jolon)	US-101 to San Lucas Rd	0.582	D	1.747	F
County Road G16 (Carmel Valley Road)	SR-1 to Carmel Rancho Blvd	0.833	D	1.084	F
County Road G16 (Carmel Valley Road)	Carmel Rancho Blvd to Rio Rd	0.782	D	1.081	F
County Road G16 (Carmel Valley Road)	Rio Rd to Rancho San Carlos Rd	1.305	F	1.89	F
County Road G16 (Carmel Valley Road)	Rancho San Carlos Rd to Valley Greens Dr	1.434	F	2.055	F
County Road G16 (Carmel Valley Road)	Valley Greens Dr to Robinson Canyon Rd	1.01	F	1.507	F
County Road G16 (Carmel Valley Road)	Robinson Canyon Rd to Miramonte Rd	1.006	F	1.473	F
County Road G16 (Carmel Valley Road)	Miramonte Rd to Laureles Grade	0.946	E	1.122	F
County Road G16 (Carmel Valley Road)	Laureles Grade to Ford Rd	0.933	E	1.43	F
County Road G16 (Carmel Valley Road)	Ford Rd to Esquiline Rd	0.745	D	0.882	D
County Road G17 (Reservation)	Davis Rd to SR-68	0.698	D	1.575	F

County Road G17 (River Rd)	SR-68 to Las Palmas Rd	0.481	C	1.042	F
County Road G17 (River Rd)	Las Palmas Rd to Las Palmas Pkwy	0.805	D	1.5	F
County Road G20 (Laureles Grade Rd)	SR-68 to Robley Rd	0.591	D	1.002	F
Blanco Rd	Reservation Rd to Cooper Rd	2.033	F	2.35	F
Blanco Rd	Cooper Rd to Armstrong Rd	2.146	F	2.408	F
Blanco Rd	Armstrong Rd to Davis Rd	2.292	F	2.592	F
Calle Del Adobe	Boranda Rd to Post Dr	0.359	C	1.125	F
Camino Del Monte	Carmel City Line to Serra Ave	0.531	D	1.542	F
Carpenter St	Serra Ave to SR-1	1.354	F	1.892	F
Crazy Horse Canyon Rd	San Juan Grade Rd to US-101	0.449	C	1.199	F
Davis Rd	Blanco Rd to Reservation Rd	0.958	E	1.135	F
Ocean Ave	Carmel City Line to SR-1	1.229	F	1.5	F
Pine Canyon Rd (King City)	Pine Meadow Dr to Merritt St	0.258	C	1.375	F
Porter Dr	Salinas Rd to San Juan Rd	0.967	E	1.142	F
Porter Dr	San Juan Rd to Santa Cruz County Line	1.423	F	1.846	F
Rio Rd	Carmel City Line to SR-1	1.161	F	1.375	F
Russell Rd	SR-101 to San Juan Grade Rd	0.661	D	1.042	F
Salinas Rd	SR-1 to Fruitland Ave	0.972	E	1.019	F
San Benancio Rd	Harper Canyon Rd to SH-68	0.568	D	1.177	F
San Juan Grade Rd	Salinas City Line to Russell Rd	1.015	F	1.378	F
San Juan Grade Rd	Russell Rd to Rogge Rd	0.747	D	1.37	F
San Juan Grade Rd	Hebert Rd to Crazy Horse Canyon Rd	0.402	C	1.259	F
Roadway Segments Operating at LOS E in the Existing plus Project Buildout Scenario					
County Road G17 (Reservation)	East Garrison Rd to Davis Rd	0.418	C	0.986	E
Corral De Tierra	SH-68 to Robley Rd	0.682	D	0.802	E
Espinosa Rd	SR-183 to US-101	0.896	E	0.979	E
Harris Rd	Spreckels Blvd to Abbott St	0.844	E	0.823	E
Roadway Segments Operating at Deficient LOS D in the Existing plus Project Buildout Scenario					
County Road G16 (Carmel Valley Road)	Holman Rd to Via Los Tulares	Refer to existing conditions analysis		0.548	D
County Road G16(Carmel Valley Road)	SR-1 to Carmel Rancho Blvd			1.084	F
County Road G16(Carmel Valley Road)	Carmel Rancho Blvd to Rio Rd			1.081	F
County Road G16(Carmel	Rio Rd to Rancho San Carlos Rd			1.89	F

Valley Road)					
County Road G20 (Laureles Grade Rd)	Robley Rd to Carmel Valley Rd	0.582	D	0.916	D
Carmel Rancho Blvd	Carmel Valley Blvd to Carmel Rancho Ln	0.619	D	0.758	D
Carmel Rancho Blvd	Carmel Rancho Ln to Rio Rd	0.402	C	0.475	D
Rio Rd	SR-1 to Carmel Rancho Blvd	0.575	D	0.679	D

Source: Kimley-Horn and Associates, Inc.

Table 4.6-22 presents the Regional roadway segments operating at LOS E or LOS F under Existing plus Project Buildout conditions and compares the segments to their LOS under existing conditions. Exhibit 4.6.9 presents the segment LOS graphically. A detailed table showing the volume, the volume to capacity ratio and the resulting LOS for each Regional roadway segment is included in the Appendix.

There are nine regional roadway segments that operate at LOS E and 55 segments that operate at LOS F under this scenario. Under existing conditions, 54 of these Regional roadway segments operate at LOS E or F, so development in the County at buildout causes an additional ten roadway segments to exceed the County's LOS threshold.

Table 4.6-22. Regional Roadway Segments Operating at LOS E or F under Existing plus Project Buildout Conditions

		Existing Conditions		Existing plus Project Buildout Conditions	
Roadway Segment		V/C Ratio	LOS	V/C Ratio	LOS
Roadway Segments Operating at LOS F in the Existing plus Project Buildout Scenario					
US Highway 101	County Border to Crazy Horse Canyon Rd	1.044	F	1.136	F
US Highway 101	Crazy Horse Canyon Rd to San Miguel Canyon Rd	0.989	E	1.076	F
US Highway 101	San Miguel Canyon Rd to SR-156	1.441	F	1.567	F
US Highway 101	SR-156 to Pesante Rd	1.106	F	1.202	F
US Highway 101	Pesante Rd to Espinosa Rd	1.106	F	1.202	F
US Highway 101	Espinosa Rd to E Boronda Rd	1.098	F	1.195	F
US Highway 101	E Boronda Rd to W Laurel Dr	1.143	F	1.243	F
US Highway 101	W Laurel Dr to N Main St	1.107	F	1.234	F

Roadway Segment		Existing Conditions		Existing plus Project Buildout Conditions	
		V/C Ratio	LOS	V/C Ratio	LOS
US Highway 101	N Main St to E Market St	1.172	F	1.275	F
US Highway 101	E Market St to John St	1.114	F	1.211	F
SR-1	Salinas Rd to Struve Rd	1.546	F	1.683	F
SR-1	Struve Rd to Dolan Rd	1.667	F	1.811	F
SR-1	Dolan Rd to Molera Rd	1.496	F	1.627	F
SR-1	Molera Rd to SR-183	1.426	F	1.550	F
SR-1	Fremont Blvd to Canyon del Rey Blvd	1.006	F	1.094	F
SR-1	Canyon del Rey Blvd to Del Monte Ave	1.071	F	1.165	F
SR-1	N Fremont St to Aguajito Rd	1.411	F	1.534	F
SR-1	Holman Hwy to Carpenter St	0.890	D	1.080	F
SR-1	Carpenter St to Ocean Ave	1.447	F	1.842	F
SR-1	Ocean Ave to Carmel Valley Rd	1.208	F	1.422	F
SR-68 (Holman Highway)	Forest Ave to 17 Mile Dr	1.448	F	1.644	F
SR-68 (Holman Highway)	17 Mile Dr to Skyline Forest Dr	1.638	F	1.877	F
SR-68 (Holman Highway)	Skyline Forest Dr to CHOMP Dwy	1.638	F	1.890	F
SR-68 (Holman Highway)	CHOMP Dwy to SR-1	1.638	F	1.865	F
SR-68 (Monterey Salinas Highway)	SR-1 to Olmsted Rd	1.422	F	1.641	F
SR-68 (Monterey Salinas Highway)	Olmsted Rd to Canyon del Rey Blvd	1.422	F	1.542	F
SR-68 (Monterey Salinas Highway)	Canyon del Rey Blvd to Bit Rd	1.304	F	1.540	F
SR-68 (Monterey Salinas Highway)	Bit Rd to Laureles Grade Rd	1.304	F	1.521	F
SR-68 (Monterey Salinas Highway)	Laureles Grade Rd to Corral de Tierra	1.525	F	1.834	F
SR-68 (Monterey Salinas Highway)	Corral de Tierra to Portola Dr	1.617	F	1.933	F
SR-68 (Monterey Salinas Highway)	Spreckels Blvd to E Blanco Rd	0.811	B	1.123	F
SR-156	Castroville Blvd to US-101	1.902	F	1.871	F
SR-183 (Merritt St)	SR-156 to Blackie Rd	1.184	F	1.442	F
SR-183 (Castroville Rd)	Blackie Rd to Espinosa Rd	1.074	F	1.233	F
SR-183 (Castroville Rd)	Espinosa Rd to Cooper Rd	1.012	F	1.172	F

Roadway Segment		Existing Conditions		Existing plus Project Buildout Conditions	
		V/C Ratio	LOS	V/C Ratio	LOS
SR-218 (Canyon del Rey Blvd)	Fremont Blvd to Carlton Dr	1.099	F	1.315	F
SR-218 (Canyon del Rey Blvd)	Carlton Dr to SR-68	1.099	F	1.425	F
Foam St	Prescott Ave to Drake Ave	1.156	F	2.725	F
Foam St	Drake Ave to Lighthouse Ave	1.277	F	2.858	F
Lighthouse Ave	Private Bolio Rd to Pacific St	1.27	F	1.191	F
Lighthouse Ave	Pacific St to Washington St	1.124	F	1.061	F
Del Monte Ave	Washington St to Camino Aguajito	1.314	F	1.314	F
Del Monte Ave	Camino Aguajito to Casa Verde Wy	1.313	F	1.337	F
Del Monte Ave	Casa Verde Wy to SR-1	1.443	F	1.469	F
Fremont St	Abrego St to Camino Aguajito	1.065	F	1.087	F
Munras Ave/Abrego St	Soledad Dr to Via Zaragoza	1.226	F	1.450	F
Del Monte Blvd	SR-1 to Canyon del Rey Blvd	1.039	F	1.039	F
Del Monte Blvd	Canyon del Rey Blvd to Broadway Ave	1.058	F	1.049	F
Del Monte Blvd	SR-1 to Reindollar Ave	1.081	F	1.113	F
Del Monte Blvd	Reindollar Ave to Reservation Rd	1.929	F	2.013	F
N Fremont St	Casa Verde Wy to SR-218	0.971	E	1.065	F
S Main St	Romie Ln to E Blanco Rd	0.817	D	1.079	F
John St	Abbott St to US-101	1.069	F	1.178	F
Davis Rd	W Laurel Dr to SR-183	1.057	F	1.233	F
Davis Rd	SR-183 to W Blanco Rd	2.428	F	2.870	F
Roadway Segments Operating at LOS E in the Existing plus Project Buildout Scenario					
US Highway 101	John St to S Sanborn Rd	0.897	D	0.975	E
SR-1	Del Monte Ave to N Fremont St	0.890	D	0.952	E
SR-1	Aguajito Rd to Munras Ave	0.854	D	0.929	E
Foam St	David Ave to Prescott Ave	0.661	D	0.783	E
Lighthouse Ave	Prescott Ave to Private Bolio Rd	1.637	F	0.951	E
Sanborn Rd	US-101 to Abbott St	0.983	E	0.994	E

Roadway Segment		Existing Conditions V/C Ratio	Existing Conditions LOS	Existing plus Project Buildout Conditions V/C Ratio	Existing plus Project Buildout Conditions LOS
N Main St	W Laurel Dr to E Bernal Dr	0.921	D	0.951	E
E Boronda Rd	US-101 to N Main St	0.923	D	0.970	E
S Main St	John St to Romie Ln	0.768	D	0.950	E

Source: Kimley-Horn and Associates, Inc.

Table 4.6-23 compares existing and Existing plus Project Buildout roadway LOS on Regional roadways external to Monterey County. Traffic generated by the land uses allowed under the 2007 General Plan will produce inter-county travel between housing and jobs in Santa Cruz, San Benito, and Santa Clara counties, and to a lesser extent San Luis Obispo County. With cumulative development in adjacent counties increases the demand for this inter-county travel. Development allowed under the General Plan, cumulatively with development in incorporated cities in Monterey County and development in adjacent counties, causes nearly every roadway segment to experience an increase in the volume to capacity ratio, and causes four segments to change from LOS D or better to a LOS E or F.

Table 4.6-23. Roadway Level of Service of Facilities External to Monterey County under Existing plus Project Buildout Conditions

Roadway Segment		Existing Conditions V/C Ratio	Existing Conditions LOS	Existing plus Project Buildout Conditions V/C Ratio	Existing plus Project Buildout Conditions LOS
Santa Clara County					
US Highway 101	Cochrane Rd to E Dunne Ave	1.139	F	0.820	D
US Highway 101	Masten Ave to Leavesley Rd/SR-152 West	0.989	E	0.824	D
US Highway 101	Monterey Rd to SR-25	1.071	F	0.964	E
SR-152	SR-156 to Merced County	0.630	C	0.634	C
Santa Cruz County					
SR-1	Soquel Ave to 41st St	1.368	F	1.071	F
SR-1	Airport Blvd to SR-152	0.876	D	0.731	C
SR-1	Harkings Slough Rd to SR-129	0.608	C	0.541	B
SR-1	SR-129 to Monterey County	0.492	B	0.423	B

Roadway Segment		Existing Conditions V/C Ratio	Existing Conditions LOS	Existing plus Project Buildout Conditions V/C Ratio	Existing plus Project Buildout Conditions LOS
SR-17	Santa Clara County to Granite Creek Rd	0.958	E	0.945	E
SR-129 (Riverside Rd)	Lakeview Rd to Carlton Rd	0.847	D	0.926	D
San Benito County					
US Highway 101	Santa Clara County to SR-129	0.912	E	0.809	D
SR-25(Bolsa Rd)	Santa Clara County to SR-156	1.196	F	1.049	F
SR-156	Salinas Rd to Union Rd	1.706	F	1.718	F
San Luis Obispo County					
US Highway 101	Monterey County to San Miguel Ave	0.300	A	0.314	A

Source: Kimley-Horn and Associates, Inc.

Impact of Goods Movement on Roadway Level of Service

There are no actual projections of truck traffic to buildout in the year 2092, but using employment growth as a proxy for growth in business that generates the need for freight movement, truck traffic would grow about 20% between 2030 and buildout. Therefore truck traffic would increase from 18,600 truck trips per day in 2030 to 22,200 at buildout.

As described earlier, this increase in freight movement is not significant enough to cause widespread capacity-related impacts, but will contribute large vehicle traffic to roadways and highways that are currently, or are projected to fall below the County's acceptable LOS standard and may cause the localized impacts on heavily traveled freight routes and within industrialized areas where truck traffic originates.

2007 General Plan Policies

The policies related to roadway level of service described in the Existing plus Project Development to the Year 2030 scenario apply to the Existing plus Project buildout scenario.

Significance Determination

Buildout the 2007 General Plan would increase traffic volumes on County roads, Regional roads, and regional roads external to the County. This added traffic would both cause roadway segments to exceed the County's LOS standard, and contribute traffic to roadways that exceed the LOS standard

without development, and further degrade the performance measure. Despite development contributions to county impacts (through countywide traffic impact fee), and regional impacts (through regional traffic impact fee) there will remain a funding shortfall for the improvement of County and Regional roads to achieve the County's LOS standard. Therefore this impact remains significant and unavoidable.

Mitigation Measures

Mitigation of the LOS impacts described above (see mitigation measure for Impact TRAN-2B) would require extensive County and Regional roadway widening, and intersection modifications to provide enough capacity to achieve the County's LOS D (or LOS C within Area Plans such as the CVMP) standard on all impacted segments, some outside of Monterey County. Additionally, mitigation would include substantial increases in public transportation services.

The mitigation measures recommended for implementation by the County to achieve LOS standards within the CVMP area under the 2030 Cumulative plus Project scenario are applicable to this scenario. However, segments of Carmel Valley Road and SR 1 in the CVMP area will exceed the CVMP level of standards, and no further mitigation of these facilities is feasible. Therefore this impact will be significant and unavoidable.

Significance Conclusion

Buildout of the 2007 General Plan would have a significant and unavoidable impact on County roads, and Regional roads both within and external to Monterey County. No mitigation is proposed for these facilities and they remain significant and unavoidable.

Air Traffic

Impact TRAN-3C: Buildout of the 2007 General Plan would increase demand for air travel at the County's four airports or increase development within the approach and departure pattern of airports. (Less Than Significant)

Impact of Development with Policies

The discussion of air traffic impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to this scenario.

Significance Determination

As described earlier, development of the land uses allowed under the 2007 General Plan would result in an increase in demand for air travel. Passenger travel in Monterey County peaked in 1978 with about 640,000 passengers annually. Since that time passenger travel has declined to nearly half of its peak (Monterey Airport District, 2008). Without adding additional capacity at airports, the current passenger level could increase to at least 640,000 passengers annually without impacting airport operations (a 96% increase).

Land use growth proposed in the general Plan and specifically the Highway 68/Monterey Peninsula Airport Affordable Housing Overlay will not be located within airport flight paths, and will not be designed in such a way as to become an incompatible land use (i.e., high rise buildings). No change in airport location is being proposed in the 2007 General Plan. This is a less than significant impact.

Mitigation Measures

Impacts would be less than significant, therefore no mitigation measures are necessary.

Significance Conclusion

The development of the General Plan would increase the demand for the air travel. The General Plan contains policies to encourage safe operations of air facilities and land uses surrounding the airports that are consistent with airport operations. Airport passenger demand is significantly less than it was in 1978 and therefore can accommodate substantial increases without increasing the capacity of airports. Impacts of the General Plan policies under Existing plus Project Buildout are less than significant.

Roadway Hazards

Impact TRAN-3D: Buildout of the 2007 General Plan would result in non-standard or hazardous designs or land uses that are incompatible with public facilities and adjoining land uses. (Less Than Significant)

Impact of Development with Policies

The discussion of roadway hazard impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to this scenario.

Significance Determination

Buildout of the 2007 General Plan would result in non-standard or hazardous designs and incompatible facilities with adjoining land uses. The General Plan policies described earlier to prevent or reduce these impacts or limit incompatible land uses. Therefore, the impact of roadway hazards at buildout of the 2007 General Plan is less than significant.

Mitigation Measures

No additional mitigation measures beyond the 2007 General Plan are necessary.

Significance Conclusion

Buildout of the General Plan would result in non-standard or hazardous transportation facility designs or land uses that are incompatible with public facilities. However, the 2007 General Plan contains policies to ensure that new development provides access and improvements to the county roadway system to meet County standards. It also contains policies to prevent incompatible land uses to avoid transportation conflicts and roadway hazards. Therefore, the impact is less than significant.

Emergency Access

Impact TRAN-3E: Buildout of the 2007 General Plan would result in inadequate emergency access. (Significant and Unavoidable)

Impact of Development with Policies

The discussion of emergency access impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to this scenario.

Significance Determination

Buildout of the 2007 General Plan would result in inadequate emergency access due to increases in traffic that result in County and Regional roadways exceeding County LOS standards, and creating traffic congestion that slows emergency response time.

The General Plan policies discussed above address transportation related impacts to emergency response due to congestion, and design. However, even with the adoption of county and regional impact fees, and implementation of proposed transportation improvements at the County and Regional level, traffic impacts to County and Regional roadway level of service will remain significant and unavoidable, and thereby cause an impact to emergency response that significant and unavoidable.

Mitigation Measures

The mitigation measures described under the Existing plus Project Development to the Year 2030 are applicable to this scenario.

Significance Conclusion

Buildout of the 2007 General Plan would generate traffic that would cause County and Regional roadways to exceed the County's LOS D standard, and contribute to roadways that exceed the standard without development, causing traffic congestion that would impact emergency response time. This is a significant and unavoidable impact.

Alternative Transportation

Impact TRAN-3F: Buildout of the 2007 General Plan would conflict with adopted policies, plans, or programs supporting alternative transportation or generate pedestrian, bicycle, or transit travel demand that would not be accommodated by current pedestrian facilities, bicycle development plans, or long-range transit plans. (Less than Significant)

Impact of Development with Policies

The discussion of air traffic impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to this scenario.

Significance Determination

As described earlier, implementation of the policies in the General Plan and Area Plans for buildout of the General Plan would increase pedestrian, bicycle and transit-supportive facilities by both requiring and encouraging the construction of such facilities and land use patterns in new development. These policies provide support for, and do not conflict with, alternative modes of transportation. The transit-supportive land uses identified in the general Plan are consistent with MST's objective to provide transit-oriented development (Designing for Transit - A Manual for Integrating Public Transit and Land Use in Monterey County, MST, 2006).

The land uses allowed under the General Plan, if consistent with policy, would increase the need for transit service with concentrations of development in existing transit-served corridors, community areas, and near incorporated cities. The increase in demand for transit service is consistent with MST's strategic goals of increasing transit ridership, expanding service, and introducing new services such as BRT in major corridors (Peninsula Area Service Study, 2006 and Business Plan and Short Range Transit Plan, FY 2008 through 2008). Therefore, this impact is less than significant.

Mitigation Measures

No mitigation measures are necessary.

Significance Conclusion

The policies contained in the General Plan provide both requirements and encouragement of alternative mode infrastructure and facilities, and promote transit-support land use patterns. These polices support and do not conflict with existing facilities, policies, plans and programs. The development allowed under the General Plan will generate demand for pedestrian and bicycle facilities, and demand for transit services. These demands can be accommodated by ensuring development conforms to County policies and design standards, and are consistent with the goals and strategies of MST, the County's transit service provider. This is a less than significant impact.

Buildout Cumulative plus Project

Buildout Cumulative plus Project conditions represent forecast year 2092 conditions with full implementation of the allowed land uses in the 2007 General Plan and projected growth in incorporated cities through the year 2092. This scenario includes development in adjacent counties (Santa Cruz, San Benito, and Santa Clara) to the year 2030 since growth projections to 2092 for those counties are not available.

This scenario identifies the impacts of development in unincorporated areas of the County cumulative with development in incorporated areas and adjacent counties by identifying changes in roadway level of service. This analysis of the 2007 General Plan is compared to No Project conditions under the 1982 General Plan.

Project-Specific Impacts of the Development under Buildout Cumulative plus Project Conditions

Impact TRAN-4A: Buildout of the 2007 General Plan cumulatively with development in incorporated cities and adjacent counties would cause project-specific impacts on County roadways which would cause roadways to fall below the acceptable LOS standard D. (Less Than Significant Impact).

Impact of Development with Policies

Project-specific impacts of new development are described in Impact TRAN-1A.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Existing plus Project Buildout scenario.

Significance Determination

Project-specific impacts of new development will continue to occur through buildout of the General Plan. As long as General Plan policies remain in effect, new development will be required to prepare a project-level traffic study, or project-level Environmental Impact Report. Impacts to roadway LOS or project access would be identified in these studies and development would be fully responsible for the implementation of mitigation measures or would be responsible for its fair-share of the mitigation depending on the extent of the impact and the development's contribution to the impact along with other cumulative development. If a roadway already falls below the County's LOS standard, then the development is required to mitigate its impact so that the measure of performance (e.g., volume to capacity ratio, peak hour average delay, etc.) of the roadway does not degrade beyond the level without the development. This is a less than significant impact.

Mitigation Measures

Impacts are less than significant, therefore no mitigation is necessary.

Significance Conclusion

Implementation of the 2007 General Plan consistent with policies related to project-specific localized impacts (Policy C-1.4, new development is required to mitigate project-specific local impacts to maintain the County's LOS standard and to provide adequate access and circulation facilities. Policy C-1.3 restricts new development or requires the phasing of new development so that it is concurrent with transportation improvements) would have a less than significant impact and no mitigation is required.

County and Regional Roadway Level of Service Impacts (Buildout Cumulative plus Project)

Impact TRAN-4B: Buildout of the 2007 General Plan cumulatively with development in incorporated cities and in adjacent counties would create *traffic increases on* County and Regional roadways which would cause the LOS to exceed the LOS D standard, or contribute traffic to County and Regional roads that exceed the LOS standard without development. (Significant and unavoidable impact)

Impact of Development with Policies

The LOS on study area roadways for the Buildout Cumulative plus Project scenario is illustrated graphically in Exhibit 4.6.10. A detailed analysis of roadway level of service by segment is included in the Appendix.

Table 4.6-24 shows the roadway segments operating at deficient level of service under this scenario. As shown in Table 4.6-24, there are nine segments that operate at LOS E and 59 segments that operate at LOS F in this scenario. In comparison, under Existing plus Project Buildout conditions, 43 of the segments in Table 4.6-24 currently operate at LOS E or F. This indicates that buildout of the County, cumulatively with development in incorporated cities and adjacent counties cause an additional 25 roadway segments to exceed the County's LOS standard.

Table 4.6-24. County Roadway Segments Operating at LOS E or F under Buildout Cumulative plus Project Conditions

		Buildout Cumulative plus Project Conditions	
Roadway Segment		V/C Ratio	LOS
Roadway Segments Operating at LOS F in the Buildout Cumulative Conditions Scenario			
County Road G11 (San Juan Rd)	Salinas Rd to San Miguel Canyon Rd	1.14	F
County Road G12 (Elkhorn Rd)	Salinas Rd to Hall Rd	1.29	F
County Road G12 (Hall Rd)	Elkhorn Rd to San Miguel Canyon Rd	2.97	F
County Road G12 (San Miguel Canyon Rd)	Hall Rd to Strawberry Rd	1.32	F
County Road G12 (San Miguel Canyon Rd)	Strawberry Rd to Castroville Blvd	1.55	F
County Road G12 (San Miguel Canyon Rd)	Castroville Blvd to US-101	1.46	F
County Road G14 (Jolon)	US-101 to San Lucas Rd	1.88	F
County Road G16 (Carmel Valley Road)	SR-1 to Carmel Rancho Blvd	1.30	F
County Road G16 (Carmel Valley Road)	Carmel Rancho Blvd to Rio Rd	1.35	F
County Road G16 (Carmel Valley Road)	Rio Rd to Rancho San Carlos Rd	2.45	F
County Road G16 (Carmel Valley Road)	Rancho San Carlos Rd to Valley Greens Dr	3.13	F
County Road G16 (Carmel Valley Road)	Valley Greens Dr to Robinson Canyon Rd	2.27	F
County Road G16 (Carmel Valley Road)	Robinson Canyon Rd to Miramonte Rd	2.35	F
County Road G16 (Carmel Valley Road)	Miramonte Rd to Laureles Grade	1.85	F
County Road G16 (Carmel Valley Road)	Laureles Grade to Ford Rd	1.94	F
County Road G16 (Carmel Valley Road)	Ford Rd to Esquiline Rd	1.13	F
County Road G16 (Carmel Valley Road)	Holman Rd to Via Los Tulares	1.08	F
County Road G17 (Reservation)	Blanco Rd to East Garrison Rd	1.96	F
County Road G17 (Reservation)	East Garrison Rd to Davis Rd	2.23	F
County Road G17 (Reservation)	Davis Rd to SR-68	1.47	F
County Road G17 (River Rd)	SR-68 to Las Palmas Rd	1.28	F
County Road G17 (River Rd)	Las Palmas Rd to Las Palmas Pkwy	1.01	F
County Road G17 (River Rd)	Las Palmas Pkwy to Pine Canyon Rd	1.21	F
County Road G17 (River Rd)	Pine Canyon Rd to Chualar River Rd	1.51	F
County Road G17 (River Rd)	Chualar River Rd to Gonzales River Rd	1.05	F
County Road G17 (River Rd)	Foothill Rd to Arroyo Seco Rd	1.25	F

Roadway Segment		Buildout Cumulative plus Project Conditions V/C Ratio	LOS
County Road G20 (Laureles Grade Rd)	Robley Rd to Carmel Valley Rd	1.37	F
Blanco Rd	W Alisal St to SR-68	1.29	F
Blanco Rd	SR-68 to Abbott St	1.67	F
Arroyo Seco Rd	Fort Romie Rd to US-101	1.56	F
Blanco Rd	Reservation Rd to Cooper Rd	3.34	F
Blanco Rd	Cooper Rd to Armstrong Rd	3.13	F
Blanco Rd	Armstrong Rd to Davis Rd	3.33	F
Camino Del Monte	Carmel City Line to Serra Ave	1.60	F
Carpenter St	Carmel City Line to Serra Ave	1.55	F
Carpenter St	Serra Ave to SR-1	2.43	F
Chualar Rd	US-101 to Old Stage Rd	1.60	F
Corral De Tierra	SH-68 to Robley Rd	1.33	F
Crazy Horse Canyon Rd	San Juan Grade Rd to US-101	1.71	F
Espinosa Rd	SR-183 to US-101	1.18	F
Grant St	Scott St to Clay St	1.07	F
Harris Rd	Spreckels Blvd to Abbott St	2.13	F
Nashua Rd	SR-1 to Cooper Rd	1.46	F
Ocean Ave	Carmel City Line to SR-1	2.00	F
Old Stage Rd	Hebert Rd to Natividad Rd	1.75	F
Old Stage Rd	Natividad Rd to Williams Rd	3.28	F
Pine Canyon Rd (King City)	Pine Meadow Dr to Merritt St	1.38	F
Pine Canyon Rd (King City)	Merrit St to Jolon Rd	1.14	F
Porter Dr	Salinas Rd to San Juan Rd	1.54	F
Porter Dr	San Juan Rd to Santa Cruz County Line	3.19	F
Prunedale North Rd	SR-156 to San Miguel Canyon	1.65	F
Rio Rd	Carmel City Line to SR-1	2.27	F
Rogge Rd	San Juan Grade Rd to Natividad Rd	1.29	F
Russell Rd	SR-101 to San Juan Grade Rd	2.39	F
Salinas Rd	Fruitland Ave to Elkhorn Rd	1.17	F
San Benancio Rd	Harper Canyon Rd to SH-68	1.27	F
San Juan Grade Rd	Salinas City Line to Russell Rd	2.11	F
San Juan Grade Rd	Russell Rd to Rogge Rd	2.15	F
San Juan Grade Rd	Hebert Rd to Crazy Horse Canyon Rd	1.33	F
Spreckels Blvd	SR-68 to Harkins Rd	1.21	F
Roadway Segments Operating at LOS E in the Buildout Cumulative Conditions Scenario			
County Road G12(Salinas Rd)	Railroad Ave to Elkhorn Rd	0.98	E

Roadway Segment		Buildout Cumulative plus Project Conditions V/C Ratio	LOS
County Road G20 (Laureles Grade Rd)	SR-68 to Robley Rd	0.96	E
Munras Ave/Abrego St	Fremont St to Soledad Dr	0.88	E
N Fremont St	SR-1 to Casa Verde Wy	0.96	E
Grant St	Payson Rd to Scott St	0.99	E
Pajaro St	SR-183 to Geil St	0.85	E
Portola Dr (Toro Park)	Reservation Rd to Creekside Ter	0.79	E
Portola Dr (Toro Park)	Anza Dr to Manolete Dr	0.89	E
San Miguel Canyon Rd	Tarpey Rd to Hall Rd	0.93	E
Roadway Segments Operating at Deficient LOS D in the Buildout Cumulative Conditions Scenario			
County Road G16 (Carmel Valley Road)	Esquiline Rd to Holman Rd	0.522	D
County Road G16 (Carmel Valley Road)	Holman Rd to Via Los Tulares	0.890	D
County Road G16 (Carmel Valley Road)	Via Los Tulares to Cachagua Rd	0.753	D
Carmel Rancho Blvd	Carmel Valley Blvd to Carmel Rancho Ln	0.775	D
Carmel Rancho Blvd	Carmel Rancho Ln to Rio Rd	0.625	D
Rio Rd	SR-1 to Carmel Rancho Blvd	0.754	D

Source: Kimley-Horn and Associates, Inc.

Impact of Development in the Carmel Valley Area Plan

The traffic analysis of the CVMP and the Carmel Valley Transportation Improvement Program used to present impacts of the General Plan on 2030 Cumulative Projects did not evaluate impacts of buildout of the General Plan to the year 2092. Therefore, roadway segments within the Carmel Valley Master Plan area are analyzed using the daily level of service methodology used to analyze other roadways in the County. These segments are included in Table 4.6-XX above and Table 4.6-YY below.

Table 4.6-25 presents the Regional roadway segments operating at LOS E or LOS F under 2030 Cumulative plus Project conditions. Exhibit 4.6.10 presents the segment LOS graphically. A detailed table showing the volume, the volume to capacity ratio and the resulting LOS for each Regional roadway segment is included in the Appendix.

There are eight regional roadway segments that operate at LOS E and 84 segments that operate at LOS F under this scenario. Under Existing plus Project Buildout conditions, 64 of these Regional roadway segments operate at LOS E or F, so buildout of the County cumulatively with development in

incorporated cities and adjacent counties causes an additional 20 roadway segments to exceed the County's LOS threshold.

Table 4.6-25. Regional Roadway Segments Operating at LOS E or F under Buildout Cumulative plus Project Conditions

Roadway Segment		Buildout Cumulative plus Project V/C Ratio	LOS
Roadway Segments Operating at LOS F in the Buildout Cumulative plus Project Scenario			
US Highway 101	County Border to Crazy Horse Canyon Rd	1.136	F
US Highway 101	Crazy Horse Canyon Rd to San Miguel Canyon Rd	1.076	F
US Highway 101	San Miguel Canyon Rd to SR-156	1.597	F
US Highway 101	SR-156 to Pesante Rd	2.000	F
US Highway 101	Pesante Rd to Espinosa Rd	2.002	F
US Highway 101	Espinosa Rd to E Boronda Rd	1.556	F
US Highway 101	E Boronda Rd to W Laurel Dr	1.615	F
US Highway 101	W Laurel Dr to N Main St	1.967	F
US Highway 101	N Main St to E Market St	1.796	F
US Highway 101	E Market St to John St	1.831	F
US Highway 101	John St to S Sanborn Rd	1.569	F
US Highway 101	S Sanborn Rd to Airport Blvd	1.402	F
US Highway 101	Airport Blvd to Abbott St	1.495	F
US Highway 101	Spence Rd to Chualar Rd	1.090	F
US Highway 101	Chualar Rd to Old Stage Rd	1.729	F
US Highway 101	Old Stage Rd to 5th St	1.640	F
US Highway 101	5th St to S Alta St	1.531	F
US Highway 101	S Alta St to Camphora Rd	1.576	F
US Highway 101	Camphora Rd to Moranda Rd	1.606	F
US Highway 101	Moranda Rd to Front St	1.442	F
US Highway 101	Front St to Arroyo Seco Rd	1.321	F
US Highway 101	Arroyo Seco Rd to El Camino Real	1.053	F
SR-1	County Border to Salinas Rd	1.374	F
SR-1	Salinas Rd to Struve Rd	2.044	F
SR-1	Struve Rd to Dolan Rd	2.209	F
SR-1	Dolan Rd to Molera Rd	2.040	F
SR-1	Molera Rd to SR-183	1.960	F
SR-1	Imjin Pkwy to Light Fighter Dr	1.094	F
SR-1	Light Fighter Dr to Fremont Blvd	1.091	F
SR-1	Canyon del Rey Blvd to Del Monte Ave	1.330	F
SR-1	Del Monte Ave to N Fremont St	1.023	F

Roadway Segment		Buildout Cumulative plus Project V/C Ratio	LOS
SR-1	N Fremont St to Aguajito Rd	1.534	F
SR-1	Aguajito Rd to Munras Ave	1.114	F
SR-1	Holman Hwy to Carpenter St	1.346	F
SR-1	Carpenter St to Ocean Ave	2.208	F
SR-1	Ocean Ave to Carmel Valley Rd	1.457	F
SR-68 (Holman Highway)	Forest Ave to 17 Mile Dr	2.092	F
SR-68 (Holman Highway)	17 Mile Dr to Skyline Forest Dr	2.411	F
SR-68 (Holman Highway)	Skyline Forest Dr to CHOMP Dwy	2.405	F
SR-68 (Holman Highway)	CHOMP Dwy to SR-1	1.184	F
SR-68 (Monterey Salinas Highway)	SR-1 to Olmsted Rd	2.01	F
SR-68 (Monterey Salinas Highway)	Olmsted Rd to Canyon del Rey Blvd	2.16	F
SR-68 (Monterey Salinas Highway)	Canyon del Rey Blvd to Bit Rd	2.11	F
SR-68 (Monterey Salinas Highway)	Bit Rd to Laureles Grade Rd	2.13	F
SR-68 (Monterey Salinas Highway)	Laureles Grade Rd to Corral de Tierra	2.55	F
SR-68 (Monterey Salinas Highway)	Corral de Tierra to Portola Dr	1.56	F
SR-68 (Monterey Salinas Highway)	Reservation Rd to Spreckels Blvd	1.01	F
SR-68 (Monterey Salinas Highway)	Spreckels Blvd to E Blanco Rd	1.78	F
SR-146 (Front St)	US-101 to East St (on Front St)	1.99	F
SR-146 (Metz Rd)	East St to County Rd G-15	1.05	F
SR-183 (Castroville Rd)	Blackie Rd to Espinosa Rd	1.945	F
SR-183 (Castroville Rd)	Espinosa Rd to Cooper Rd	1.828	F
SR-183 (Castroville Rd)	Cooper Rd to S Davis Rd	1.211	F
SR-218 (Canyon del Rey Blvd)	SR-1 to Del Monte Blvd	1.386	F
SR-218 (Canyon del Rey Blvd)	Del Monte Blvd to Fremont Blvd	1.101	F
SR-218 (Canyon del Rey Blvd)	Fremont Blvd to Carlton Dr	1.753	F
SR-218 (Canyon del Rey Blvd)	Carlton Dr to SR-68	1.822	F
Foam St	Prescott Ave to Drake Ave	2.945	F
Foam St	Drake Ave to Lighthouse Ave	2.864	F
Lighthouse Ave	David Ave to Prescott Ave	1.197	F
Lighthouse Ave	Prescott Ave to Private Bolio Rd	1.893	F
Lighthouse Ave	Private Bolio Rd to Pacific St	1.638	F
Lighthouse Ave	Pacific St to Washington St	1.618	F
Del Monte Ave	Washington St to Camino Aguajito	1.865	F
Del Monte Ave	Camino Aguajito to Casa Verde Wy	1.940	F
Del Monte Ave	Casa Verde Wy to SR-1	2.932	F
Fremont St	Abrego St to Camino Aguajito	1.657	F
Munras Ave/Abrego St	Soledad Dr to Via Zaragoza	2.396	F

Roadway Segment		Buildout Cumulative plus Project V/C Ratio	LOS
Del Monte Blvd	SR-1 to Canyon del Rey Blvd	2.120	F
Del Monte Blvd	Canyon del Rey Blvd to Broadway Ave	1.793	F
Fremont Blvd	N Del Monte Blvd to SR-1	1.621	F
Del Monte Blvd	SR-1 to Reindollar Ave	2.065	F
Del Monte Blvd	Reindollar Ave to Reservation Rd	3.715	F
N Fremont St	Casa Verde Wy to SR-218	2.136	F
Sanborn Rd	US-101 to Abbott St	1.524	F
N Main St	San Juan Grade Rd to W Laurel Dr	1.423	F
N Main St	W Laurel Dr to E Bernal Dr	1.508	F
E Boronda Rd	US-101 to N Main St	2.692	F
John St	Abbott St to US-101	1.469	F
Market St	Davis Rd to N Main St	1.150	F
Davis Rd	W Laurel Dr to SR-183	1.54	F
Blanco Rd	S Davis Rd to W Alisal St	1.997	F
Blanco Rd	W Alisal St to SR-68	1.294	F
Blanco Rd	SR-68 to Abbott St	1.673	F
Roadway Segments Operating at LOS E in the Buildout Cumulative plus Project Scenario			
US Highway 101	Central Ave to Jolon Rd	0.900	E
SR-1	Del Monte Blvd to Reservation Rd	0.932	E
SR-1	Reservation Rd to Del Monte Blvd	0.961	E
SR-1	Remont Blvd to Canyon del Rey Blvd	0.947	E
SR-68 (Monterey Salinas Highway)	Portola Dr to Reservation Rd	0.967	E
SR-146 (East St)	Front St to Metz Rd	0.993	E
Munras Ave/Abrego St	Fremont St to Soledad Dr	0.883	E
N Fremont St	SR-1 to Casa Verde Wy	0.955	E

Source: Kimley-Horn and Associates, Inc.

Table 4.6-26 presents Buildout Cumulative plus Project roadway LOS on Regional roadways external to Monterey County. Traffic generated by buildout of the 2007 General Plan will produce inter-county travel between housing and jobs in Santa Cruz, San Benito, and Santa Clara counties, and to a lesser extent San Luis Obispo County. Buildout of the General Plan, cumulatively with development in incorporated cities in Monterey County and development in adjacent counties, causes seven segments to change from LOS D or better to a LOS E or F.

Table 4.6-26. Roadway Level of Service of Facilities External to Monterey County under Cumulative plus Project Buildout Conditions

Roadway Segment		Existing plus Project Buildout Conditions V/C Ratio	LOS	Buildout Cumulative plus Project Conditions V/C Ratio	LOS
Santa Clara County					
US Highway 101	Cochrane Rd to E Dunne Ave	0.820	D	1.618	F
US Highway 101	Masten Ave to Leavesley Rd/SR-152 West	0.824	D	1.305	F
US Highway 101	Monterey Rd to SR-25	0.964	E	1.485	F
SR-152	SR-156 to Merced County	0.634	C	1.177	F
Santa Cruz County					
SR-1	Soquel Ave to 41st St	1.071	F	1.586	F
SR-1	Airport Blvd to SR-152	0.731	C	1.392	F
SR-1	Harkings Slough Rd to SR-129	0.541	B	1.171	F
SR-1	SR-129 to Monterey County	0.423	B	0.878	D
SR-17	Santa Clara County to Granite Creek Rd	0.945	E	0.670	C
SR-129 (Riverside Rd)	Lakeview Rd to Carlton Rd	0.926	D	0.957	E
San Benito County					
US Highway 101	Santa Clara County to SR-129	0.809	D	1.019	F
SR-25 (Bolsa Rd)	Santa Clara County to SR-156	1.049	F	2.074	F
SR-156	Salinas Rd to Union Rd	1.718	F	1.988	F
San Luis Obispo County					
US Highway 101	Monterey County to San Miguel Ave	0.314	A	0.585	C

Source: Kimley-Horn and Associates, Inc.

Impact of Goods Movement on Roadway Level of Service

As described earlier, the county's current truck traffic generation is expected to increase through buildout of the General Plan. While the increase in freight movement is not significant enough to cause widespread capacity-related impacts, it will contribute large vehicle traffic to roadways and highways that are currently, or are projected to fall below the County's acceptable LOS standard and may cause the localized impacts on heavily

traveled freight routes and within industrialized areas where truck traffic originates.

Comparison with No Project Scenario

The No Project scenario represents buildout of the County to the year 2092 under the General Plan currently in effect (1982). Table 4.6-24 earlier compared the housing, population and employment forecasts between the 1982 and 2007 General Plans. The comparison indicated that buildout of the 2007 General Plan would result in a net increase in daily trips greater than what would be generated at buildout of the 1982 General Plan. Therefore the LOS impacts of buildout of the 2007 General Plan would be greater than those of the 1982 General Plan.

2007 General Plan Policies

The 2007 General Plan policies establish measures to minimize adverse impacts of roadway level of service impacts of development both individually and cumulatively. The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Buildout Cumulative plus Project scenario.

Significance Determination

Buildout of the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would increase traffic volumes on County roads, Regional roads, and regional roads external to the County. This added traffic would both cause roadway segments to exceed the County's LOS standard, and contribute traffic to roadways that exceed the LOS standard without development, and further degrade the performance measure.

Despite development contributions to county impacts (through countywide traffic impact fee), and regional impacts (through regional traffic impact fee) there will remain a funding shortfall for the improvement of County and Regional roads to achieve the County's LOS standard. Therefore this impact remains significant and unavoidable.

Mitigation Measures

Mitigation of the impacts described above to achieve a LOS D include:

- Widening County and Regional roadway from existing 2-lane facilities to 4, 6, or 8-lanes facilities;
- Expand existing intersections to include additional through and turning lanes;
- Install traffic signals;

- Grade-separate intersections of the junction between major streets;
- Widen state highway to accommodate additional travel lanes, provide shoulders, and auxiliary lanes between on and off-ramps; and
- Increase public transportation services by expanding MST's fleet, expand fixed-route services, increase headways, provide park and ride facilities, and implement new services including Bus Rapid Transit, and inter-city rail service.

Many of the mitigations for roadways segments are likely infeasible due to physical, topographical, and environmental constraints, as well the social and economic impacts related to the acquisition of commercial and residential property, or loss of access, and lack of community consensus for roadway capacity-enhancing projects. This construction would result in impacts to other resources, such as biological resources, air quality, noise, aesthetics and agricultural lands. The foremost constraint, however, is funding of transportation facilities. Federal, state and regional funding are limited, and most of these funds are used to maintain the transportation system. The County and TAMC are planning to implement Traffic Impact Fees to fund improvement projects, but the amount of the fees are limited for affordability and total fee burden reasons. Further, another source of funding, voter initiatives to increase sales tax to fund transportation projects, have failed recently, but may be an option in the future.

The County and regional fee programs will continuously be updated, adding additional priority projects to the programs as initial projects are completed, but the rate of project completion will not be able to outpace the rate of development growth.

The mitigation measures identified for the CVMP are recommended under 2030 Cumulative plus Project Conditions remain applicable in this scenario

Significance Conclusion

With buildout of the 2007 General Plan, and implementation of mitigation measures determined to be feasible, there would remain significant and unavoidable impacts on County roads, and Regional roads both within and external to Monterey County.

Air Traffic

Impact TRAN-4C: Buildout of the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would increase demand for air travel at the County's four airports or increase development within the approach and departure pattern of airports. (Less than Significant)

Impact of Development with Policies

The discussion of air traffic impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the Year 2030 Cumulative plus Project scenario.

Significance Determination

Buildout of the 2007 General Plan would result in an increase in demand for air travel. As stated earlier, airport utilization can double in annual passengers over current conditions. Additionally, land use growth proposed in the general Plan and specifically the Highway 68/Monterey Peninsula Airport Affordable Housing Overlay will not be located within airport flight paths, and will not be design in such a way as to become an incompatible land use (i.e., high rise buildings). No change in airport location is being proposed in the 2007 General Plan. (Less than Significant Impact).

Mitigation Measures

Impacts would be less than significant, therefore no mitigation measures are necessary.

Significance Conclusion

Buildout of the General Plan would increase the demand for the air travel. The General Plan contains policies to encourage safe operations of air facilities and land uses surrounding the airports that are consistent with airport operations. Airport passenger demand is significantly less than it was in 1978 and therefore can accommodate substantial increases without increasing the capacity of airports. Impacts of the General Plan policies under Buildout Cumulative plus Project are less than significant.

Roadway Hazards

Impact TRAN-4D: Growth in land uses allowed under the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would result in non-standard or hazardous designs or land uses that are incompatible with public facilities and adjoining land uses. (Less Than Significant)

Impact of Development with Policies

The discussion of roadway hazard impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to this scenario.

Significance Determination

Buildout of the 2007 General Plan by the year 2030 would result in non-standard or hazardous designs and incompatible facilities with adjoining land uses. The General Plan provides for policies to prevent or reduce these impacts by requiring roads to be designed to safety standards. These policies require new development to design facilities to County standards, and limit incompatible land uses. Therefore, the impact of roadway hazards with buildout of the 2007 General Plan is less than significant.

Mitigation Measures

No additional mitigation measures beyond the 2007 General Plan are necessary.

Significance Conclusion

Buildout of the General Plan would result in non-standard or hazardous transportation facility designs or land uses that are incompatible with public facilities. However, the 2007 General Plan contains policies to ensure that new development provides access and improvements to the county roadway system to meet County standards. It also contains policies to prevent incompatible land uses to avoid transportation conflicts and roadway hazards. Therefore, the impact is less than significant.

Emergency Access

Impact TRAN-4E: Buildout of the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would result in inadequate emergency access. (Significant and Unavoidable)

Impact of Development with Policies

The discussion of emergency access impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to the this scenario.

Significance Determination

Buildout of the 2007 General Plan under Buildout Cumulative plus Project conditions would result in inadequate emergency access due to increases in traffic that result in County and Regional roadways exceeding County LOS standards, and creating traffic congestion that slows emergency response time.

The General Plan policies discussed above address transportation related impacts to emergency response due to congestion, and design. However, even with the adoption of county and regional impact fees, and implementation of proposed transportation improvements at the County and Regional level, traffic impacts to County and Regional roadway level of service will remain significant and unavoidable, and thereby cause an impact to emergency response that significant and unavoidable.

Mitigation Measures

The mitigation measures described under the Existing plus Project Development to the Year 2030 are applicable to this scenario.

Significance Conclusion

The development allowed in the 2007 General Plan would generate traffic that would cause County and Regional roadways to exceed the County's LOS D standard, and contribute to roadways that exceed the standard without development, causing traffic congestion that would impact emergency response time. Mitigation includes developing emergency response route and connectivity plans, and requiring new development to implement these

plans, but will not mitigate LOS impacts on County and Regional roads. This is a significant and unavoidable impact.

Alternative Transportation

Impact TRAN-4F: Buildout of the 2007 General Plan, cumulatively with development in incorporated cities and adjacent counties, would conflict with adopted policies, plans, or programs supporting alternative transportation or generate pedestrian, bicycle, or transit travel demand that would not be accommodated by current pedestrian facilities, bicycle development plans, or long-range transit plans. (Less than Significant)

Impact of Development with Policies

The discussion of air traffic impacts in the Existing plus Project Development to the year 2030 scenario remains applicable in this scenario.

2007 General Plan Policies

The policies related to roadway level of service for development described in the Existing plus Project Development to the Year 2030 scenario apply to this scenario.

Significance Determination

Policies in the General Plan and Area Plans increase pedestrian, bicycle and transit-supportive facilities by both requiring and encouraging the construction of such facilities and land use patterns in new development. These policies provide support for, and do not conflict with, alternative modes of transportation. The transit-supportive land uses identified in the General Plan are consistent with MST's objectives.

Buildout of the General Plan, if consistent with policy, would increase the need for transit service with concentrations of development in existing transit-served corridors, community areas, and near incorporated cities. The increase in demand for transit service is consistent with MST's strategic goals of increasing transit ridership, expanding service, and introducing new services such as BRT in major corridors. Therefore, this impact is less than significant.

Mitigation Measures

No mitigation measures are necessary.

Significance Conclusion

The policies contained in the General Plan provide both requirements and encouragement of alternative mode infrastructure and facilities, and promote transit-support land use patterns. These polices support and do not conflict with existing facilities, policies, plans and programs. The development allowed under the General Plan will generate demand for pedestrian and bicycle facilities, and demand for transit services. These demands can be accommodated by ensuring development conforms to County policies and design standards, and are consistent with the goals and strategies of MST, the County's transit service provider. This is a less than significant impact.

4.6.4 Agriculture and Wine Corridor Plan

4.6.4.1 Abstract

The 2007 General Plan includes an Agriculture and Winery Corridor Plan (AWCP) intended to strike a balance between the wine grape production and wine processing capabilities within the County and maintain the viability of this industry. In order to encourage the development of the area's wine industry, the plan designates three winery corridors along the Salinas Valley and establishes land use policies and standards for the development of new wine-related facilities within the region.

The full buildout scenario of the AWCP would allow the development of 40 artisan wineries, 10 full-scale wineries and 10 tasting rooms along three corridors that extend through three Planning Areas (Toro, Central Salinas Valley, and South County) and include more than 80 miles of Salinas Valley roadways. The AWCP identifies the following three winery corridors (as shown in Exhibit 4.6.11):

1. **River Road Segment** – Consisting generally of River Road from Highway 68 south excluding the west side of the road between a point 500 feet north of Las Palmas and 1000 feet south of Pine Canyon (Salinas), Chualar River Road, Gonzales River Road, Foothill Road, Fort Romie Road, Paraiso Springs Road, Los Coches Road, Thorn Road, the lower section of Arroyo Seco Road, Elm Road south of Highway 101, Central Avenue from Elm Avenue south to Highway 101, and Hobson Road.
2. **Metz Road Segment** – Consisting generally of Metz Road from the City of Soledad south to Elm Road, and Elm Road from Metz Road to the City of Greenfield.
3. **Jolon Road Segment** – Consisting generally of Jolon Road from Highway 101 near King City south to Highway 101 north of Bradley, Cross Road, Gillett Road, Lockwood-Jolon Road from Cross Road to Gillett Road, and Interlake Road.

The AWCP is designed to expand the tourism and agricultural industries, which will in turn cause an increase in traffic including seasonal employee trips as well as truck trips and visitor trips. Buildout of the 2007 General Plan with implementation of the AWCP would potentially result in significant impacts on transportation if new vehicle trips generated by growth anticipated by the 2007 General Plan results in deficient roadway performance for any County roads identified within the AWCP. This section focuses on that impact.

Since the AWCP is included in the other scenarios described above, all other impacts are addressed.

4.6.4.2 Methodology

To determine impacts of buildout of the 2007 General Plan on Monterey County roadways, existing and projected roadway volumes are compared to Monterey County roadway LOS standards. Because peak visitor traffic associated with wine-related facilities typically occurs on weekends, impacts to County roads within the designated Wine Corridor were analyzed for weekday and weekend conditions. Three different analysis scenarios were prepared and are listed below:

- Existing plus Project Development to the Year 2030. This analysis is based on the existing roadway network (2008).
- 2030 Cumulative plus Project Conditions. This analysis is based on the roadway network that includes the TAMC and countywide capacity enhancing projects.
- Existing plus Project Buildout. This analysis is based on the roadway network that includes the TAMC and countywide capacity enhancing projects.

Because the forecasting methodology based on the AMBAG Model only produces weekday traffic projections, a weekday-to-weekend conversion factor was derived based on data from an area with comparable land uses and characteristics.

SR-29 is a north-south highway that runs through agricultural and winery region of Napa County, California, which is known for its established wine industry. This corridor was selected as a comparable because upon implementation of the AWCP the roads within the Monterey County Wine Corridor are expected to experience weekend traffic patterns similar to those of SR-29. The weekday-to-weekend factor was determined by comparing existing weekend traffic volumes along SR-29 to existing weekday volumes, resulting in a calculated weekday-to-weekend ratio. This ratio was used to project weekend volumes from the AMBAG Model weekday forecasts for roads within the Agricultural and Winery Corridor.

For each analysis scenario, the projected roadway segment volumes are compared to the County LOS thresholds, resulting in LOS conditions for each segment.

4.6.4.3 Impact Analysis

Existing plus Project Development to the Year 2030

Impact TRAN-5A: Growth in land uses allowed under the 2007 General Plan to the year 2030 would create adverse impacts to County roads within the Agricultural and Winery Corridor. (Less Than Significant With Mitigation).

Impact of Development with Policies

The projected level of service (LOS) on Agriculture and Winery Corridor roadways for the Existing plus Project Development to the Year 2030 are shown in Table 4.6-27. This analysis is based on the existing 2008 roadway network. This table compares the 2030 to existing conditions. Two segments exceed the LOS D standard and operate at LOS F during both weekday and weekend conditions. Neither of these segments is deficient under existing conditions.

Table 4.6-27. County and Regional Roadway Segments Level of Service under Existing plus Project Development to the Year 2030 Conditions

	Existing Conditions				Existing plus Project Development to the Year 2030			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
CENTRAL / ARROYO SECO / RIVER ROAD SEGMENT								
SR-68 (Monterey Salinas Highway)								
Portola Dr to Reservation Rd	0.48	C	0.53	C	0.48	C	0.53	C
Reservation Rd to Spreckels Blvd	0.48	C	0.53	C	0.43	B	0.48	C
County Road G16 (Carmel Valley Road/Arroyo Seco Rd/Elm Ave)								
Carmel Valley Rd to Elm Ave	0.05	C	0.06	C	0.09	C	0.10	C
Arroyo Seco Rd to Central Ave	0.04	C	0.04	C	0.06	C	0.07	C
County Road G17 (Reservation Rd/River Rd/Ft Romie Rd/Arroyo Seco Rd)								
SR-68 to Las Palmas Rd	0.48	C	0.53	D	0.60	D	0.67	D

	Existing Conditions				Existing plus Project Development to the Year 2030			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
Las Palmas Rd to Las Palmas Pkwy	0.81	D	0.90	D	1.01	F	1.12	F
Las Palmas Pkwy to Pine Canyon Rd	0.43	C	0.48	C	0.51	D	0.56	D
Pine Canyon Rd to Chualar River Rd	0.42	C	0.46	C	0.49	D	0.54	D
Chualar River Rd to Gonzales River Rd	0.08	C	0.09	C	0.10	C	0.11	C
Gonzalez River Rd to Foothill Rd	0.06	C	0.07	C	0.07	C	0.08	C
Foothill Rd to Arroyo Seco Rd	0.19	C	0.21	C	0.27	C	0.30	C
Ft Romie Rd to Elm Ave	0.20	C	0.22	C	0.21	C	0.23	C
Alta St								
Old Stage Rd to Gonzales City Line	0.44	C	0.49	D	0.44	C	0.49	D
Arroyo Seco Rd								
Fort Romie Rd to US-101	0.28	C	0.31	C	0.37	C	0.41	C
Central Ave								
Elm Ave to US-101	0.05	C	0.05	C	0.07	C	0.07	C
Chualar River Rd								
River Rd to Foletta Rd	0.33	C	0.36	C	0.34	C	0.38	D
Gonzales River Rd								
River Rd to Alta St	0.20	C	0.22	C	0.21	C	0.24	C
Spreckels Blvd								
SR-68 to Harkins Rd	0.48	D	0.54	D	0.47	C	0.53	D
METZ ROAD SEGMENT								
SR-146								
East St to County Road G-15 (on Metz Rd)	0.22	C	0.24	C	0.23	C	0.25	C
County Road G-15 to Stonewall Canyon Rd	0.22	C	0.24	C	0.23	C	0.26	C
County Road G15 (Metz Rd)								
SR-146 to Elm Ave	0.07	C	0.08	C	0.08	C	0.08	C
Elm Ave to Spreckels Rd	0.05	C	0.06	C	0.07	C	0.08	C
County Road G16 (Carmel Valley Road/Arroyo Seco Rd/Elm Ave)								
US-101 to Metz Rd	0.10	C	0.11	C	0.11	C	0.12	C
JOLON ROAD SEGMENT								

	Existing Conditions				Existing plus Project Development to the Year 2030			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
County Road G14 (Jolon Rd/Interlake Rd)								
US-101 to San Lucas Rd	0.58	D	0.65	D	1.06	F	1.18	F
San Lucas Rd to Lockwood	0.10	C	0.11	C	0.13	C	0.15	C
Lockwood to County Border	0.02	C	0.02	C	0.02	C	0.02	C
County Road G18 (Jolon Rd)								
Lockwood to US-101	0.06	C	0.07	C	0.08	C	0.09	C
Lockwood-San Lucas Rd								
US-101 to Jolon Rd	0.03	C	0.04	C	0.04	C	0.05	C

Source: Kimley-Horn and Associates, Inc.

Impact of Goods Movement

The land uses allowed in the AWCP under the 2007 General Plan will generate the need to move agricultural products throughout the corridor and the region. This movement is primarily through the use of trucks, but also through the use of aircraft. According to the AWCP, currently 65-70% of the grape production is shipped out of Monterey County to wineries elsewhere, whereas only 5% of wines produced are produced as a Monterey appellation. This is because the Monterey wine growing region has a high ratio of vineyards to wineries (over 1,900 vineyard acres to the winery) and grows more grapes annually than can be produced into wine. Therefore, the grapes are sold to wineries in other California regions.

With buildout of the uses allowed in the AWCP, the area will see an increase in wineries and wine producing facilities without a significant increase in the acres of vineyards. The increase in wine producing facilities will increase the amount of trucking that remains internal to the corridor and traveling shorter distances, thus reducing the impact of trucking on regional roadways outside of the corridor. Truck trips are expected to increase within the corridor. This increase in trips is addressed in the roadway level of service analysis described above.

Impact of Special Events

The AWCP allows for special events within the corridor that would attract additional visitors and employees. These special events include industry-wide events that encompass all of the uses within the corridor and promote visitation to the corridor, winery-related events (with up to 150 people per event) such as

fund raising events, dinners and weddings, and private events such as corporate meetings or private parties.

Larger events that would attract 500 or more visitors within the corridor are required to obtain a separate permit that involves review of the event conditions by the Sheriff's Department, Fire and Public Works relative to public health and safety. If this review results in a determination that police officers will be required to maintain order and for traffic control, the event sponsor will be required to arrange and pay for police staff. The event sponsor is also required to submit plans to the county identifying proposed location(s) and availability for off-site parking to support the number of persons anticipated at events.

2030 Cumulative plus Project Conditions

Impact of Development with Policies

The projected level of service (LOS) on Agriculture and Winery Corridor roadways for the 2030 Cumulative plus Project are shown in **Table 4.6-28**. This analysis is based on the future roadway that includes the TAMC and countywide capacity enhancements. This scenario is compared to the Existing plus Project Development to the Year 2030 to determine impacts of the AWCP when combined with cumulative traffic.

There is one segment that operates at LOS E (Spreckels Boulevard) and one segment that operates at LOS F (County Road G14) during either weekday or weekend conditions under this scenario. Additionally, one of the impacted segments in the Existing plus Project scenario would meet the County's LOS standard in the Buildout scenario because this two-lane segment of roadway would be widened to four lanes under the County's future capacity enhancements, as described in the methodology section.

Table 4.6-28. County and Regional Roadway Segments Level of Service under 2030 Cumulative Conditions

	Existing plus Project Development to the Year 2030				2030 Cumulative plus Project			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
CENTRAL / ARROYO SECO / RIVER ROAD SEGMENT								
SR-68 (Monterey Salinas Highway)								
Portola Dr to Reservation Rd	0.48	C	0.53	C	0.59	C	0.66	C
Reservation Rd to Spreckels Blvd	0.43	B	0.48	C	0.61	C	0.67	C
County Road G16 (Carmel Valley Road/Arroyo Seco Rd/Elm Ave)								
Carmel Valley Rd to Elm Ave	0.09	C	0.10	C	0.08	C	0.09	C

	Existing plus Project Development to the Year 2030				2030 Cumulative plus Project			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
Arroyo Seco Rd to Central Ave	0.06	C	0.07	C	0.06	C	0.06	C
County Road G17 (Reservation Rd/River Rd/Ft Romie Rd/Arroyo Seco Rd)								
SR-68 to Las Palmas Rd	0.60	D	0.67	D	0.61	D	0.68	D
Las Palmas Rd to Las Palmas Pkwy	1.01	F	1.12	F	0.48	C	0.54	D
Las Palmas Pkwy to Pine Canyon Rd	0.51	D	0.56	D	0.51	D	0.56	D
Pine Canyon Rd to Chualar River Rd	0.49	D	0.54	D	0.46	C	0.51	D
Chualar River Rd to Gonzales River Rd	0.10	C	0.11	C	0.13	C	0.14	C
Gonzalez River Rd to Foothill Rd	0.07	C	0.08	C	0.08	C	0.09	C
Foothill Rd to Arroyo Seco Rd	0.27	C	0.30	C	0.28	C	0.31	C
Ft Romie Rd to Elm Ave	0.21	C	0.23	C	0.25	C	0.28	C
Alta St								
Old Stage Rd to Gonzales City Line	0.44	C	0.49	D	0.65	D	0.72	D
Arroyo Seco Rd								
Fort Romie Rd to US-101	0.37	C	0.41	C	0.40	C	0.44	C
Central Ave								
Elm Ave to US-101	0.07	C	0.07	C	0.05	C	0.06	C
Chualar River Rd								
River Rd to Foletta Rd	0.34	C	0.38	D	0.48	D	0.54	D
Gonzales River Rd								
River Rd to Alta St	0.21	C	0.24	C	0.20	C	0.22	C
Spreckels Blvd								
SR-68 to Harkins Rd	0.47	C	0.53	D	0.88	D	0.98	E
METZ ROAD SEGMENT								
SR-146								
East St to County Road G-15 (on Metz Rd)	0.23	C	0.25	C	0.68	D	0.75	D
County Road G-15 to Stonewall Canyon Rd	0.23	C	0.26	C	0.25	C	0.27	C
County Road G15 (Metz Rd)								
SR-146 to Elm Ave	0.08	C	0.08	C	0.10	C	0.11	C
Elm Ave to Spreckels Rd	0.07	C	0.08	C	0.17	C	0.19	C
County Road G16								

	Existing plus Project Development to the Year 2030				2030 Cumulative plus Project			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
(Carmel Valley Road/Arroyo Seco Rd/Elm Ave)								
US-101 to Metz Rd	0.11	C	0.12	C	0.12	C	0.14	C
JOLON ROAD SEGMENT								
County Road G14 (Jolon Rd/Interlake Rd)								
US-101 to San Lucas Rd	1.06	F	1.18	F	1.08	F	1.20	F
San Lucas Rd to Lockwood	0.13	C	0.15	C	0.16	C	0.18	C
Lockwood to County Border	0.02	C	0.02	C	0.05	C	0.05	C
County Road G18 (Jolon Rd)								
Lockwood to US-101	0.08	C	0.09	C	0.13	C	0.15	C
Lockwood-San Lucas Rd								
US-101 to Jolon Rd	0.04	C	0.05	C	0.06	C	0.07	C

Source: Kimley-Horn and Associates, Inc.

Area Plan Policies

The Agriculture and Winery Corridor Plan (AWCP) policies and design standards summarized below set forth measures to avoid and minimize adverse impacts to roads located in the Winery Corridor.

Agricultural Winery Corridor Plan

The AWCP requires that road improvements within the corridor be designed to retain the rural character of the area and should be limited to enhancing the scenic corridor and promoting safe circulation. AWCP Section 3.5 (parking regulations) establishes parking standards for developments in the planning area, while AWCP Section 3.7 requires that access to facilities shall be designed to meet safe sight distance standards as determined by the Monterey County Public Works department. Development guidelines in Section 3.6 require permits for special events to address off-site parking and traffic control. Section 4.5 (financing plan) includes the establishment of Area Capital Improvement and Financing Plans (CIFP) to fund roadway improvements to enhance safety and to maintain the LOS standard established in the County General Plan.

Significance Determination

Cumulative development and land use activities in the proposed 2007 General Plan within the 2030 planning horizon would result in two roadway segments exceeding the LOS D standard, or adding traffic to roadway segments that are already exceeding the standard. This is considered a significant impact.

Mitigation Measures

Mitigation Measure TRAN-5A: The roadway segments exceeding LOS standards are two-lane rural roads that provide left turn lanes at some intersections. These segments include County Road G14 between US 101 and San Lucas Road, and Spreckels Boulevard between SR-68 and Harkins Road. Improvement of these segments would be funded through a combination of project-specific mitigation for individual developments, and through a Capital Improvement and Financing Plan fair-share funding mechanism established for the Corridor by the Public Works Department. These improvements would be implemented when:

1. A proposed development's project-specific assessment identifies a direct impact to the facility in terms of either LOS or safety.
2. A proposed development gains access from an intersection within the segment.
3. A corridor-wide nexus study prepared for the required Capital Improvement and Financing Plan identifies the level of development that can occur before triggering the improvements.

To maintain the rural character of the area, there are no plans to widen these roadways to four lane facilities. Therefore, the capacity of these segments will be increased by:

1. Providing left turn lanes at intersections without left turn lanes and where the frequency of turning vehicles affects through vehicle movement; and/or
2. Increasing the width of the roadway shoulder at intersections to allow vehicles to pass turning vehicles; and/or
3. Constructing passing lanes as determined in the Capital Improvement and Financing Plan.

Significance Conclusion

Development of the 2007 General Plan through the year 2030 is projected to result in adverse impacts to county roads within the Wine Corridor. The impacts can be mitigated through implementation of rural highway capacity and safety improvements focused at intersections without the need to widen roadways. These mitigations will be implemented through a combination of project-specific mitigation for individual developments, and through a

Capital Improvement and Financing Plan fair-share funding mechanism. Therefore, this impact is less than significant.

Existing plus Project Buildout of the General Plan

Impact TRAN-5B: Buildout of the 2007 General Plan would create adverse impacts to County roads within the Agricultural Winery Corridor. (Less than Significant).

Impact of Development with Policies

The resulting level of service for each corridor segment is presented in Table 4.6-29. Two segments operate at LOS E on weekdays or weekends and two segments operate at LOS F on weekdays or weekends under this scenario. Under existing conditions, all of these segments operate at LOS D or better, so buildout of the General Plan and AWCP in the year 2092 causes four roadway segments along the corridor to exceed the county's LOS standard. This scenario includes the TAMC and County capacity enhancements described earlier, one of which affects the Wine Corridor. Implementation of these projects would improve the LOS at one of the deficient roadway segments.

Table 4.6-29. County and Regional Roadway Segments Level of Service under Existing plus Project Buildout Conditions

	Existing Conditions				Existing plus Project Buildout			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
CENTRAL / ARROYO SECO / RIVER ROAD SEGMENT								
SR-68 (Monterey Salinas Highway)								
Portola Dr to Reservation Rd	0.48	C	0.53	C	0.6	C	0.64	C
Reservation Rd to Spreckels Blvd	0.48	C	0.53	C	0.6	C	0.62	C
County Road G16 (Arroyo Seco Rd/Elm Ave)								
Carmel Valley Rd to Elm Ave	0.05	C	0.06	C	0.1	C	0.15	C
Arroyo Seco Rd to Central Ave	0.04	C	0.04	C	0.1	C	0.11	C
County Road G17 (River Rd/Ft Romie Rd/Arroyo Seco Rd)								
SR-68 to Las Palmas Rd	0.48	C	0.53	D	1.0	F	1.16	F

	Existing Conditions				Existing plus Project Buildout			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
Las Palmas Rd to Las Palmas Pkwy	0.81	D	0.90	D	0.55	C	0.64	D
Las Palmas Pkwy to Pine Canyon Rd	0.43	C	0.48	C	0.9	D	0.99	E
Pine Canyon Rd to Chualar River Rd	0.42	C	0.46	C	0.9	D	1.00	E
Chualar River Rd to Gonzales River Rd	0.08	C	0.09	C	0.2	C	0.18	C
Gonzalez River Rd to Foothill Rd	0.06	C	0.07	C	0.1	C	0.11	C
Foothill Rd to Arroyo Seco Rd	0.19	C	0.21	C	0.4	C	0.40	C
Ft Romie Rd to Elm Ave	0.20	C	0.22	C	0.2	C	0.26	C
Alta St								
Old Stage Rd to Gonzales City Line	0.44	C	0.49	D	0.5	C	0.51	D
Arroyo Seco Rd								
Fort Romie Rd to US-101	0.28	C	0.31	C	0.5	D	0.55	D
Central Ave								
Elm Ave to US-101	0.05	C	0.05	C	0.1	C	0.09	C
Chualar River Rd								
River Rd to Foletta Rd	0.33	C	0.36	C	0.4	D	0.43	D
Gonzales River Rd								
River Rd to Alta St	0.20	C	0.22	C	0.2	C	0.27	C
Spreckels Blvd								
SR-68 to Harkins Rd	0.48	D	0.54	D	0.5	D	0.56	D
METZ ROAD SEGMENT								
SR-146								
East St to County Road G-15 (on Metz Rd)	0.22	C	0.24	C	0.2	C	0.26	C
County Road G-15 to Stonewall Canyon Rd	0.22	C	0.24	C	0.3	C	0.29	C
County Road G15 (Metz Rd)								
SR-146 to Elm Ave	0.07	C	0.08	C	0.1	C	0.09	C
Elm Ave to Spreckels Rd	0.05	C	0.06	C	0.1	C	0.09	C

	Existing Conditions				Existing plus Project Buildout			
	Weekday		Weekend		Weekday		Weekend	
Roadway Segment	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS	V/C Ratio	LOS
County Road G16 (Elm Ave)								
US-101 to Metz Rd	0.10	C	0.11	C	0.1	C	0.13	C
JOLON ROAD SEGMENT								
County Road G14 (Jolon Rd/Interlake Rd)								
US-101 to San Lucas Rd	0.58	D	0.65	D	1.7	F	1.94	F
San Lucas Rd to Lockwood	0.10	C	0.11	C	0.1	C	0.14	C
Lockwood to County Border	0.02	C	0.02	C	0.0	C	0.04	C
County Road G18 (Jolon Rd)								
Lockwood to US-101	0.06	C	0.07	C	0.1	C	0.11	C
Lockwood-San Lucas Rd								
US-101 to Jolon Rd	0.03	C	0.04	C	0.1	C	0.06	C

Source: Kimley-Horn and Associates, Inc.

Area Plan Policies

The Agriculture Winery Corridor Plan policies mentioned above are applicable to this scenario.

Significance Determination

Buildout by 2092 would result in LOS E/F for four roadway segments within the Winery Corridor. These roads would experience increased congestion due to the changes in land uses and the intensity of land uses. Implementation of the planned County capacity enhancement improve one segment to a LOS D (widening Road G17 from Las Palmas Road to Las Palmas Parkway), but the policies of the AWCP discourage widening roadways to preserve their rural character.

Mitigation Measures

Mitigation measure TRAN-5A is applicable to this scenario.

Significance Conclusion

Buildout of the 2007 General Plan is projected to result in adverse impacts to county roads within the Wine Corridor. The impacts can be mitigated through implementation of rural highway capacity and safety improvements focused at intersections without the need to widen roadways, thus preserving the corridor's rural character. These mitigations will be implemented

through a combination of project-specific mitigation for individual developments, and through a Capital Improvement and Financing Plan fair-share funding mechanism. Therefore, this impact is less than significant.

4.7 Air Quality

4.7.1 Abstract

This section describes the setting and impacts of the proposed project with regard to air quality. Specifically, this section focuses on the relationship between topography and climate, discusses federal and state ambient air quality standards and existing air quality conditions in the project study area, identifies land uses that could be sensitive to decreased air quality, and describes the overall regulatory framework for air quality management in California and the region. It then identifies the potential air quality impacts that would result from implementation of the 2007 General Plan and proposes mitigation measures to reduce any significant impacts to less-than-significant levels. Climate change is a related topic that is discussed in Section 4.16 of this EIR.

4.7.2 Environmental Setting

4.7.2.1 Climate and Meteorology

The project study area is located within the County of Monterey, which is in the North Central Coast Air Basin (NCCAB), where the Monterey Bay Unified Air Pollution Control District (MBUAPCD) is charged with maintaining air quality.

The NCCAB comprises 5,159 square miles along California's central coast and includes Monterey, Santa Cruz, and San Benito Counties. The northwest sector of the basin is dominated by the Santa Cruz Mountains. The Diablo Range marks the northeastern boundary and, together with the southern extent of the Santa Cruz Mountains, forms the Santa Clara Valley, which extends into the northeastern tip of the basin. Farther south, the Santa Clara Valley evolves into the San Benito Valley, which extends northwest–southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley, which extends from Salinas at the northwest end to King City at the southeast end. The western side of the Salinas Valley is formed by the Sierra de Salinas, which also forms the eastern side of the smaller Carmel Valley; the coastal Santa Lucia Range defines the western side of the valley.

The semi-permanent high-pressure cell in the eastern Pacific is the basic controlling factor in the climate of the air basin. In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement.

The generally northwest–southeast orientation of mountain ridges tends to restrict and channel the summer onshore air currents. Surface heating in the interior portion of the Salinas and San Benito Valleys creates a weak low pressure, which intensifies the onshore airflow during the afternoon and evening.

In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The airflow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific high-pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay area or the Central Valley into the NCCAB.

During the winter, the Pacific High migrates southward and has less influence on the air basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito Valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the basin as a whole in winter and early spring.

4.7.2.2 Air Pollutants

The federal and state governments have established ambient air quality standards (AAQS) for six criteria pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter smaller than or equal to 10 microns in diameter (PM_{10}), and lead. Ozone and PM_{10} are generally considered to be regional pollutants, as these or their precursors affect air quality on a regional scale. Pollutants such as CO, NO_2, SO_2, and lead are considered "local" pollutants that tend to accumulate in the air locally. PM_{10} is considered both a localized and regional pollutant. In the project study area, CO, PM_{10} and ozone (and the ozone precursors, nitrogen oxides [NO_X] and reactive organic gases [ROG]) are of particular concern. A complete summary of state and national AAQS is provided in Table 4.7-1.

Ozone

Ozone occurs in two layers of the atmosphere. The layer nearest Earth's surface is the troposphere and extends approximately 10 miles above ground level, where it meets the stratosphere. The stratosphere extends upward to approximately 30 miles above ground level and protects life on earth from the sun's harmful ultraviolet rays (UV-B).

Ozone is a photochemical pollutant and needs volatile organic compounds (VOCs), NO_X, and sunlight to form. Therefore, VOCs and NO_X are ozone precursors. The primary sources of VOC within the planning area are on- and off-road motor vehicles, cleaning and surface coatings, solvent evaporation, landfills, petroleum production and marketing, and prescribed burning. The primary sources of NO_x are on- and off-road motor vehicles, stationary source

fuel combustion, and industrial processes (MBUAPCD 2008). According to the MBUAPCD Air Quality Management Plan, rough estimates of current NCCAB VOC emissions are in the range of 100 to 125 tons per day (MBUAPCD 2008). The majority of these are thought to be produced in Monterey County's oak woodlands and coastal chaparral environments. Rough estimates of NO_x are in the range of 1 to 5 tons per day, and are the highest during wildfire events. Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with abundant sunlight. They are emitted from various sources throughout the Basin, and to reduce ozone concentrations, their emission needs to be controlled. However, high ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their places of origin. Although ozone in the stratosphere protects the earth from harmful ultraviolet radiation, high concentrations of ground-level ozone in the troposphere can adversely affect the human respiratory system and other tissues. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems such as forests and foothill plant communities, as well as agricultural crops and human-made materials such as rubber, paint, and plastics. Societal costs from ozone damage include increased healthcare costs, the loss of human and animal life, accelerated replacement of industrial equipment, and reduced crop yields.

On April 15, 2004, the Environmental Protection Agency (EPA) formally replaced the 1979 federal 1-hour ozone standard with a more stringent 8-hour standard (0.08 ppm, not to be exceeded) as part of the Clean Air Rules of 2004. To remain consistent with the stricter federal standards, the California Air Resources Board (CARB) approved a new 8-hour ozone standard (0.07 ppm, not to be exceeded) for ozone on April 28, 2005. Additionally, CARB retained the current 1-hour-average standard for ozone (0.09 ppm) and its current ultraviolet (uv) photometry monitoring method.

Carbon Monoxide

Carbon Monoxide is an odorless, colorless, toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons and other carbon-based fuels. In urban areas, automobile exhaust can cause as much as 95% of all CO emissions. At high concentrations, CO can reduce the oxygen-carrying capacity of blood and cause headaches, dizziness, unconsciousness, and death. State and federal standards for CO were not exceeded in the North Central Coast Air Basin between 2000 and 2005.

Nitrogen Oxide

Nitrogen oxides are a family of highly reactive gasses that are a primary precursor to the formation of ground-level ozone, and react in the atmosphere to form acid rain. Nitrogen dioxide, often used interchangeably with NO_X, is a reddish-brown gas that can cause breathing difficulties at high concentrations. Peak readings of NO_2 occur in areas that have a high concentration of

combustion sources (e.g., motor vehicles, power plants, refineries, and other industrial operations).

NO_X can irritate and damage the lungs and lower resistance to respiratory infections such as influenza. The health effects of short-term exposure are still uncertain. However, frequent or prolonged exposure to NO_X concentrations that are typically much higher than concentrations normally found in the ambient air may increase acute respiratory illness in children and the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may aggravate eyes and mucus membranes and cause pulmonary dysfunction.

Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air. Particulate matter is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Particulate matter also forms when gases emitted from motor vehicles and industrial sources undergo chemical reactions in the atmosphere. Natural sources of particulates include sea spray, forest fires, volcanic debris, etc. Human-made sources include fuel combustion and industrial processes, industrial and nonindustrial fugitive sources and transportation. PM_{10} particles are less than or equal to 10 microns in aerodynamic diameter. $PM_{2.5}$ particles are less than or equal to 2.5 microns in aerodynamic diameter and are a subset, or portion of PM_{10}.

PM_{10} and $PM_{2.5}$ are classified as primary or secondary depending on their origin. Primary particles are unchanged after being directly emitted (e.g., road dust). Secondary particulates are formed in the atmosphere largely by chemical reactions involving gases, e.g., sulfate from directly emitted sulfur oxides.

PM_{10} and $PM_{2.5}$ particles are small enough to be inhaled into, and lodge in, the deepest parts of the human lung. Health problems begin as the body reacts to these foreign particles. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health related effects include reduced visibility and the soiling of buildings.

Reactive Organic Gases and Volatile Organic Compounds

Hydrocarbons are organic gases that are made up of hydrogen and carbon atoms. There are several subsets of organic gases including ROGs and VOCs. ROGs are defined by state rules and regulations; VOCs are defined by federal rules and regulations. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels, or as a product of chemical processes. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation). Wineries also contribute hydrocarbons through their fermentation activities.

In very brief terms, the wine making process involves several steps including fermentation. Fermentation is the chemical process by which the natural sugars in the wine grapes are converted to alcohol through the action of yeast (either from the grape skins, or more commonly, cultured yeasts) introduced into the fermentation tank. Grapes are brought to the winery where they are passed through a destemmer-crusher that separates the grapes from their stems and breaks them open to release their juice. For white wine production, the resultant crushed grapes are then transferred to a press that separates the juice from the skins. The juice will then be transferred to fermentation tanks. For red wine, the crushed grapes (juice and skins, or "must") are sent directly to the fermentation tanks.

Fermentation occurs under temperature-controlled conditions in either stainless steel or wooden tanks. Temperature is important to the development of flavor and character. In general, white wine is fermented at a lower temperature than red wine. Red wines are generally allowed to ferment for up to 14 days. During fermentation, the nascent red wine will be circulated from time to time to prevent the skins from simply floating on top. White wine will be allowed to ferment for a week to two months.

During fermentation, the grape juice is converted to ethyl alcohol and carbon dioxide. This process also releases a number of organic compounds, including (but not limited to) volatile compounds such as aldehydes, hydrogen sulfide, and mercaptans, that will affect the flavor and aroma of the wine.

After the primary fermentation process is done, the wine may, depending on the variety of grapes, the results of the primary fermentation, and the objectives of the winemaker, be put through secondary or "malolactic" fermentation. In malolactic fermentation, bacteria are released into the wine to soften its character (removing bitterness or tartness).

At the end of the fermentation process, the resultant wine is removed from the tanks. Solids are removed from the liquid by a variety of processes. Then, the wine is transferred to barrels or other containers for aging. (Encarta 2008)

Although we tend to think of winemaking as taking place in one spot—the winery—its steps may actually take place in different facilities. Grapes may be crushed in one facility and the juice sold to wineries. Fermented wine may be exported for blending and aging elsewhere. Wineries may also transport fermented, aged wines to off-site bottling plants,

Winemaking is a complex chemical process that is as much an art as a science. Winemakers must balance innumerable natural and process-related factors to result in a wine that meets their expectations for color, aroma, and taste.

Ethanol and carbon dioxide are the primary compounds emitted during the fermentation step in the production of wines and brandy. Acetaldehyde, methyl alcohol (methanol), n-propyl alcohol, n-butyl alcohol, sec-butyl alcohol, isobutyl alcohol, isoamyl alcohol, and hydrogen sulfide also are emitted but in much

smaller quantities compared to ethanol emissions. In addition, a large number of other compounds are formed during the fermentation and aging process. Selected examples of other types of compounds formed and potentially emitted during the fermentation process include a variety of acetates, monoterpenes, higher alcohols, higher acids, aldehydes and ketones, and organosulfides (United States Environmental Protection Agency 1995).

During the fermentation step, large quantities of CO_2 are also formed and emitted. Fugitive ethanol emissions also occur during the screening of the red wine, pressing of the pomace cap, and later during aging in oak cooperage and the bottling process. In addition, small amounts of liquified SO_2 are often added to the grapes after harvest, to the "must" prior to fermentation, or to the wine after the fermentation is completed, as a preservative. As a result, small amounts of SO_2 emissions can occur during these steps. There is little potential for VOC emissions before the fermentation step in wine production. Except for harvesting the grapes and possibly unloading the grapes at the winery, there is essentially no potential for particulate (PM) emissions from this industry (United States Environmental Protection Agency 1995).

The harvest and crush of wine grapes is seasonal. In general, percentages of harvest take place as follows:

Table 4.7-1. Statewide Wine Fermentation Emissions Distribution (percentage)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.6%	1.4%	0.8%	0.5%	0.7%	0.7%	0.6%	4.8%	28.5%	32.1%	12.3%	14.0%

The health effects of hydrocarbons result from the formation of ozone and its related health effects. High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen though displacement. Carcinogenic forms of hydrocarbons are considered toxic air contaminants (air toxics). There are no separate health standards for VOCs, although some are also toxic; an example is benzene, which is both a VOC and a carcinogen.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are another group of pollutants of concern in California. There are hundreds of different types of TACs, with varying degrees of toxicity. Sources of TACS include industrial processes such as petroleum refining and chrome plating, commercial operations such as gasoline stations and dry cleaners, and motor vehicle engine exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset spill conditions. Adverse human health effects of TACs include cancer, birth defects, neurological damage, and death.

California regulates toxic air contaminants through its Air Toxics Program. CARB, working in conjunction with the State Office of Environmental Health Hazard Assessment, identifies TACs. Air toxic control measures may then be adopted to reduce ambient concentrations of the identified TAC to below a specific threshold, based on its effects on health, or to the lowest concentration achievable through the use of Best Available Control Technology for toxics (T-BACT). The program is administered by CARB. Air quality control agencies, including MBUAPCD, must incorporate air toxic control measures into their regulatory programs or adopt equally stringent control measures, such as rules, within six months of adoption by CARB.

In 1998, CARB identified diesel engine particulate matter as a TAC. Mobile sources—including trucks, buses, automobiles, trains, ships, construction equipment, and farm equipment—are the largest sources of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the particles, and because diesel particles are very small, they penetrate deeply into the lungs. Diesel engine particulate matter is a human carcinogen. The cancer risk from exposure to diesel exhaust may be much higher than the risk associated with any other toxic air pollutant routinely measured in the region.

Prior to the listing of particulate matter as a TAC, CARB had already adopted various regulations mandating a reduction in diesel emissions. These regulations include new standards for diesel engine fuel; exhaust emissions standards for new diesel trucks, buses, autos, and utility equipment; and inspection and maintenance requirements for heavy-duty vehicles. Since the listing of particulate matter as a TAC, CARB has been evaluating what additional regulatory action is needed to reduce public exposure. Future actions by CARB may include more stringent emissions requirements for diesel fuel and engines, as well as other measures to reduce public exposure.

4.7.2.3 Local Air Quality

Attainment Status

The State of California has designated the NCCAB as being in moderate nonattainment for ozone. The California Clean Air Act states that an ozone nonattainment area becomes nonattainment transitional if the state AAQS are not exceeded more than three times at any monitoring station in the air basin. The NCCAB is designated nonattainment for PM_{10} and unclassified/attainment for CO.

The EPA has designated the NCCAB as being a moderate maintenance area for ozone. The NCCAB was redesignated from a moderate nonattainment area to a maintenance area in 1997 after meeting the federal 1-hour ozone standard in 1990. The NCCAB is designated unclassified for PM_{10} and unclassified/attainment for CO.

Air Quality Monitoring Data

The existing air quality conditions in the project study area can be characterized by monitoring data collected in the region. PM_{10}, CO, and ozone concentrations are the pollutants of greatest concentration within the MBUAPCD and, therefore, are the pollutants of most concern from the proposed project. Air quality monitoring data for the last three years is presented in Table 4.7-2. The monitoring station in Monterey County is the Salinas #3 station, located at 855 E Laurel Drive in Salinas.

As shown in Table 4.7-2, the Salinas #3 monitoring station has experienced no violations of the state 1- and 8-hour ozone standard and one violation of the state PM_{10} standard during the three most recent years for which data are available. In addition, there have been no violations of the state or federal CO or $PM_{2.5}$ standard for this time period.

Sensitive Land Uses

Sensitive receptors include land uses such as residences, schools, and hospitals where building occupants are considered to be sensitive to air pollution, such as residents, recreationists, school children, hospital patients, and the elderly. Sensitive receptors are located throughout Monterey County.

4.7.3 Regulatory Framework

4.7.3.1 Air Quality Management

Federal, state, and local agencies have jurisdiction over air quality management in the North Central Coast Air Basin. Below is a summary of their activities:

Environmental Protection Agency

The EPA Region IX office oversees compliance with the Federal Clean Air Act (FCAA) and the 1990 amendments to the FCAA. The FCAA established National Ambient Air Quality Standards (NAAQS) that set levels of criteria pollutants that are considered the maximum safe levels of ambient (background) pollutant concentration, allowing an adequate margin of safety to protect human health. The current criteria pollutants are O_3, CO, NO_2, sulfur dioxide, PM_{10}, $PM_{2.5}$, and lead. Note that sulfur dioxide and lead are present only in trace quantities in the North Central Coast Air Basin because no substantial emitters of these pollutants exist within the air basin.

The EPA has exclusive air quality jurisdiction over certain types of interstate commerce including aircraft, railroads, and interstate trucking.

California Air Resources Board

CARB, part of the California EPA, monitors compliance with the California Clean Air Act (CCAA) and the 1989 amendments to the CCAA. Similar to the federal legislation, the CCAA sets forth ambient air quality standards and legal mandates to achieve these standards by the earliest practicable date. These standards apply to the same criteria pollutants as the FCAA, and include sulfate, visibility, hydrogen sulfide, and vinyl chloride.

Regulation for In-Use Off-Road Diesel Vehicles

CARB adopted a final regulation for in-use, off-road diesel vehicles, effective June 15, 2008. The purpose of this regulation is to reduce diesel particulate matter and criteria pollutant emissions from in-use, off-road diesel-fueled vehicles. The regulation applies to any person, business or government agency who owns or operates within California any diesel-fueled or alternative diesel fueled off-road, compression ignition vehicle engine with maximum power of 24 horsepower (hp) or greater that is used to provide motive power in a workover rig or to provide motive power in any other motor vehicle that: (1) cannot be registered and driven safely on-road or was not designed to be driven on-road, and (2) is not an implement of husbandry or recreational off-highway vehicle (CARB 2008). This regulation includes various requirements for retrofits and/or repowers for heavy duty diesel emissions.

Monterey Bay Unified Air Pollution Control District

The MBUAPCD has developed an extensive PM_{10} mitigation program for construction activities. MBUAPCD CEQA guidelines state that regional impacts from ozone precursor emissions in equipment exhaust (NOx and ROG) have been incorporated into the regional emissions budget. The MBUAPCD sets forth the following mitigation measures for construction:

- Water all active construction areas at least twice daily. Frequency should be based on type of operation, soil, and wind exposure.
- Prohibit all grading activities occurring during periods of high winds (over 15 mph).
- Apply chemical soil stabilizers on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Apply non-toxic binders (e.g., latex acrylic copolymer) to exposed areas after cut and fill operations and hydroseed area.
- Require Haul trucks to maintain at least 2 feet, 0 inches of freeboard.
- Cover all trucks hauling dirt, sand, or loose materials.
- Plant tree windbreaks on the windward perimeter of construction projects if adjacent to open land.
- Plant vegetative ground cover in disturbed areas as soon as possible.

- Cover inactive storage piles.
- Install wheel washers at the entrance to construction sites for all exiting trucks.
- Pave all roads at construction sites.
- Sweep streets if visible soil material is carried out from the construction site.
- Post a publicly visible sign that specifies the telephone number and person to contact regarding dust complaints. This person shall respond to complaints and take corrective action within 48 hours. The phone number of the Monterey Bay Unified Air Pollution Control District shall be visible to ensure compliance with Rule 402 (Nuisance).
- Limit the area under construction at any one time to as small as practical.

The MBUAPCD sets forth the following mitigation measures for heavy duty equipment:

- Limit the pieces of equipment used at any one time.
- Minimize the use of diesel-powered equipment (i.e., wheeled tractor, wheeled loader, roller) by using gasoline-powered equipment.
- Limit the hours of operation for heavy-duty equipment.
- Undertake project during non-zone season.
- Off-site mitigation.
- Use PuriNOx emulsified diesel fuel in existing engines.
- Modify engine with ARB verified retrofit.
- Repower with current standard diesel technology.
- Repower with CNG/ LNG technology.

The MBUAPCD sets forth the following mitigation measures for retrofits and/or repowers for heavy duty diesel engines:

- Retrofit engine models from 1993–2002 and certain 4-stroke diesel engines with DPF from Lubrizol, Cleaire, Donaldson.
- Retrofit engine models from 1993–2003 and certain 4-stroke diesel engines with an ARB Level 3 verified DPF from ECS-Lubrizol.
- Retrofit engine models from 1993–2002 and Caterpillars with PSA bi-fuel systems with ARB Level 3 verified DPF from Clean Air Power.
- Retrofit engine models from 1993–2002 and some 4-stroke diesel engines used as emergency generators with ARB Level 3 verified DPF retrofit from Clean Air systems.

- Retrofit engines from 1991–2002 and some 4-stroke diesel engines over 150 Bhp with an ARB Level 1 verified DOC from Cleaire, Donaldson, or Lubrizol.
- Repower heavy duty diesel engines with current Tier 1 or 2 diesel engines.

MBUAPCD Air Quality Management Plan

MBUAPCD is one of 35 air pollution management districts that have prepared an Air Quality Management Plan (AQMP). The MBUAPCD adopted the 2008 AQMP for the Monterey Bay region in June 2008. The 2008 AQMP relies on a multi-level partnership of federal, state, regional, and local agencies, and proposes policies and measures to achieve federal and state air quality standards for improved air quality in its jurisdictional area.

The 2008 AQMP also addresses several federal and state planning requirements, and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2008 AQMP is consistent and builds upon the approaches taken in previous AQMPs for the attainment of the state ozone and PM_{10} standards. The AQMP outlines strategies to maintain the state 1-hour AAQS and achieve the state 8-hour AAQS for ozone.

The AQMP inventories and forecasts the emissions of ozone precursors, such as VOCs, from hundreds of man-made mobile and stationary sources on a typical weekday during the May through October ozone season. This inventory is used to assess the region's progress toward attaining California's ambient air quality standard.

The present and forecasted VOC emissions from wine production are shown below in Table 4.7-2. The total 2030 VOC emissions (1.1134 tons/day or about 2,227 pounds/day) represents the amount of emissions projected to come from the fermentation and ageing of wine in Monterey County during the summer ozone season at the planning horizon.

Table 4.7-2. MBUAPCD Air Quality Management Plan VOC Emissions from Wine Fermenting and Ageing

	2008(tons/day)	2008 (lbs/day)	2030(tons/day)	2030(lbs/day)
Wine Fermentation	0.1608	322	0.2877	575
Wine Ageing	0.3648	730	16510.8257	1651
Total	0.5256	1,051	1.1134	2,227

Source: Monterey Bay Unified Air Pollution Control District. 2008b.

Rules 201 (Sources Not Requiring Permits) and 417 (Storage of Organic Liquids)

According to the MBUAPCD's Rule 201-Sources Not Requiring Permits, the following wine-making facilities do not require air district permits in order to operate:

- Wineries in operation as of May 14, 1997 with an annual production rate less than 1.25 million gallons (4.7 megaliters), and
- New or reconstructed, as defined in District Rule 207 (Review of New or Modified Sources, wineries with an annual production rate of less than 150,000 gallons (570 kiloliters).

If the winery does not fit into Rule 201, it is subject to the MBUAPCD's Rule 417-Storage of Organic Liquids. Rule 417 lists the requirements and standards for the storage of organic liquids, seals, record keeping, and vapor controls.

4.7.4 Project Impacts

4.7.4.1 Thresholds of Significance

According to Appendix G of the State CEQA Guidelines, a project would normally have a significant effect on the environment if it would

- conflict with or obstruct implementation of the applicable air quality plan,
- violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state AAQS,
- expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors affecting a substantial number of people.

The Guidelines further state that the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the determinations above. The MBUAPCD has specified significance thresholds within its CEQA Air Quality Guidelines (2008) to determine whether mitigation is needed for project-related air quality impacts. Based on consultation with MBUAPCD staff (Brennan pers. comm.) and the MBUAPCD's CEQA air quality guidelines, the following thresholds should be used in the analysis of significant air quality impacts:

Construction-Related Emissions (pounds per day)

- NO_X = 137
- PM_{10} = 82

Operation-Related Emissions (pounds per day)

- ROG = 137
- NO_X = 137
- CO = 550
- PM_{10} = 82

Based on the construction threshold of 82 pounds per day of PM_{10}, the MBUAPCD has identified levels of construction activity that could result in a significant impact. For construction involving grading, excavation, and other earthmoving activities, the MBUAPCD identified construction sites that disturb more than 2.2 acres per day as having the potential to exceed the 82 pounds-per-day threshold.

The MBUAPCD does not have significance thresholds for construction-related ozone precursors because they are accommodated in the emission inventories of state- and federally required air plans.

4.7.4.2 Impact Analysis

Buildout of the 2007 General Plan could result in impacts on air quality. New development would require the use of construction equipment and diesel vehicles. Increased population would result in an overall increase in vehicle trips and vehicle miles traveled (VMT). Impacts include the potential to conflict with air quality plans and standards, expose sensitive receptors to substantial pollutant concentrations, and create objectionable odors.

Consistency with Air Quality Plans

Impact AQ-1: Buildout of the 2007 General Plan would conflict with applicable Air Quality Management Plans and Standards. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Buildout of the 2007 General Plan would result in new urban development in undeveloped areas. New development facilitates increased population growth and would result in increased vehicle trips and VMT.

2007 General Plan Policies

The 2007 General Plan and Area Plan goals and policies summarized below set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable.

Open Space and Conservation Element

Open Space and Conservation Element Goal OS-10 provides for the protection and enhancement of Monterey County's air quality without constraining routine and ongoing agricultural activities. Policies OS 10.1-10.5 encourage land use and transit strategies to reduce air pollution. Policies OS-10.6 (support for MBUAPCD air pollution control strategies, air quality monitoring, and enforcement activities) and OS-10.9 (future development required to implement applicable MBUAPCD control measures) support this goal and reduce air quality impacts by standardizing air quality measures in the County.

Area Plan Policies

The North County Area Plan

North County Area Plan Policy NC-1.2 (mushroom operations) reduces air quality impacts by requiring new development to install environmental control methods for air quality.

Greater Salinas Area Plan

There are no applicable policies related to air quality in the Greater Salinas Area Plan.

Central Salinas Valley Area Plan

Central Salinas Valley Area Plan Policy CSV-3.2 (development of renewable energy sources) encourages the development and utilization of renewable energy sources such as solar, wind power generation, and biomass technologies in the Central Salinas Valley. This policy would help reduce air quality impacts by supporting nonpolluting energy sources.

Greater Monterey Peninsula Area Plan

Greater Monterey Peninsula Area Plan Policy GMP-2.7 (public transit) would help reduce air quality impacts by encouraging new development to incorporate alternate modes of transportation (buses, bicycles, walking).

Carmel Valley Master Plan

Carmel Valley Master Plan Policy CV-2.1 (circulation) emphasizes the use of public transit and stresses the importance of pedestrian access in the village, which would allow for reduced air quality impacts through reduction of traffic.

Toro Area Plan

Toro Area Plan Policies T-2.9 and T-2.10 (circulation) would reduce air quality impacts by encouraging new development to incorporate designs to allow for alternate modes of transportation, and also by encouraging increased accessibility for residents to mass transit.

Cachagua Area Plan

There are no policies applicable to air quality in the Cachagua Area Plan.

South County Area Plan

There are no policies applicable to air quality in the South County Area Plan.

Agricultural Winery Corridor Plan

The AWCP overlays the Toro, Central Salinas Valley, and South County Area Plans, and policies relating to air quality are applicable to the AWCP under this plan. Implementation of these policies would reduce air quality impacts in the AWCP area.

Significance Determination

Population growth under the 2007 General Plan is consistent with the growth projected in the MBUAPCD Clean Air Plan. Table 4.7-3 shows the housing, population, employment, and VMT data for 2000, 2030, and 2092 buildout conditions under the 2007 General Plan.

Table 4.7-3. Projected population and VMT growth in Monterey County

Scenario	Housing Units	Population	Employment	VMT
2000	129,571	-	222,471	8,162,834
2000 With Project	168,904	509,692	304,388	9,846,752
2030 With Project	143,009	437,665	253,060	8,532,513
2030 Cumulative	187,022	602,790	335,362	14,290,852
Cumulative 2092 Buildout	290,631	937,373	520,531	18,822,215

Source: Kimley-Horn (2008)

As shown in Table 4.7-3, an increase in County population from 2000 to buildout is anticipated to be accompanied by a concurrent increase in VMT. However, the population increase is consistent with the MBUAPCD Clean Air Plan population projections. The MBUAPCD Clean Air Plan projects that the Monterey County population will be 602,371 in 2030. Therefore, air quality would comply with the Clean Air Plan and not be significantly impacted by the buildout of the 2007 General Plan,.
New wineries would result in increased VOC emission from wine fermenting and ageing. Table 4.7-4 summarizes VOC emissions under 2030 project conditions. The estimate of gallons per year is based on per-winery production from 10 full-scale and 40 artisan wineries of varying sizes.

Table 4.7-4. VOC Emissions for 2030 Conditions of 10 Full-Scale and 40 Artisan Wineries

	Emission Factor (lbs/1000 gallons)[1]	**Gallons per Year[2] (in 1,000s)**	**VOC Emissions (lbs/ year)**	**VOC Emissions (lbs/ day)**
Fermentation-Red	6.2	4,141.2	25,675.4	187.4
Fermentation-White	2.5	6,211.8	15,529.5	113.4
Pomace Screening-Red	0.5	4,141.2	2,070.5	15.1
Pomace Press-Red	0.1	4,141.2	414.12	3.0
Storage/Ageing-Red	0.02782[3]	4,141.2	115,250	315.8
Storage/Ageing-White	0.02583[3]	6,211.8	160,451	439.6
Total			**318,390.5**	**905.3**
MBUAPCD Threshold				**137 pounds per day**

[1] Source: United States Environmental Protection Agency 2001

[2] 1 case = 2.38 gallons

[3] Source: SBCAPCD 2008.

As shown in Table 4.7-4, VOC emissions under 2030 project conditions would be within the MBUAPCD's forecast VOC emissions inventory for 2030 (2,227 pounds per day). As such, this level of emissions would be consistent with the 2008 AQMP. Therefore, the 2007 General Plan is consistent with the MBUAPCD's 2008 AQMP, and this impact is considered less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

In summary, the 2007 General Plan would not conflict with the MBUAPCD Clean Air Plan. Impacts in this regard would be less than significant.

Buildout

Impact of Development with Policies

Buildout of the 2007 General Plan to the 2092 planning horizon would result in new urban development in undeveloped areas beyond 2030 levels. New development could facilitate growth, which would in turn increase vehicle trips and VMT. This could result in significant adverse affects on air quality.

2007 General Plan Policies

The same 2007 General Plan and Area Plan policies summarized above under 2030 would apply.

Significance Determination

Buildout by 2092 would result in adverse impacts on air quality due to increased population, vehicle trips, and VMT. However, the 2007 General Plan and Area Plan policies set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable. These policies are summarized above. They include measures to promote sustainable land use decisions, improve and encourage the use of public transit and alternate modes of transportation. Therefore, air quality would not be significantly impacted by buildout of the 2007 General Plan. Impacts in this regard would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

In summary, buildout by 2092 would result in adverse impacts on air quality. However, the 2007 General Plan and Area Plan policies set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable. Therefore, air quality would not be significantly impacted by buildout of the 2007 General Plan. Impacts in this regard would be less than significant.

Construction-Related Emissions

Impact AQ-2: Generation of significant quantities of construction-related emissions would result in greater levels of air pollution. (Less-Than-Significant With Mitigation Impact.)

2030 Planning Horizon

Impact of Development with Policies

Implementation of the 2007 General Plan would result in increased construction activity. This would impact air quality by increasing ozone precursor and particulate matter emissions for an area that already exceeds ambient air quality standards. Construction activities such as demolition, grading, deliveries, hauling, and worker trips to and from project sites would generate pollutant emissions. Construction projects may also generate exhaust emissions from primarily diesel fueled equipment. Particulate matter is the pollutant of greatest concern that is emitted from construction, particularly during site preparation and grading. Particulate matter emissions can vary daily, depending on various factors, such as the level of activity, type of construction activity taking place, type of equipment in operation, and weather conditions. Off-road construction equipment is also a large source of NO_X and diesel particulate matter. While construction projects are often linear and last for a limited time, localized emissions may be substantial.

2007 General Plan Policies

The 2007 General Plan and Area Plan goals and policies summarized below set forth comprehensive measures to avoid and minimize adverse construction impacts on air quality to the maximum extent practicable.

Open Space and Conservation Element

Open Space and Conservation Element Goal OS-10 provides for the protection and enhancement of Monterey County's air quality without constraining routine and ongoing agricultural activities. Policy OS-10.8 (air quality shall be protected from naturally occurring asbestos by requiring mitigation measures to control dust and emissions during construction, grading, quarrying, or surface mining operations) reduces air quality impacts by controlling asbestos exposure during various activities that may result in natural asbestos release. Policies OS-10.6 (support for MBUAPCD air pollution control strategies, air quality monitoring, and enforcement activities) and OS-10.9 (future development required to implement applicable MBUAPCD control measures) support this goal and reduce air quality impacts by standardizing air quality measures in the County.

Area Plan Policies

The North County Area Plan

North County Area Plan Policy NC-1.2 (mushroom operations) reduces air quality impacts by requiring new development to install environmental control methods for air quality.

Greater Salinas Area Plan

There are no policies applicable to construction-related emissions in the Greater Salinas Area Plan.

Central Salinas Valley Area Plan

There are no policies applicable to construction-related emissions in the Central Salinas Valley Area Plan.

Greater Monterey Peninsula Area Plan

There are no policies applicable to construction-related emissions in the Greater Monterey Peninsula Area Plan.

Carmel Valley Master Plan

There are no policies applicable to construction-related emissions in the Carmel Valley Master Plan.

Toro Area Plan

There are no policies applicable to construction-related emissions in the Toro Area Plan.

Cachagua Area Plan

There are no policies applicable to air quality in the Cachagua Area Plan.

South County Area Plan

There are no policies applicable to air quality in the South County Area Plan.

Agricultural Winery Corridor Plan

The AWCP overlays the Toro, Central Salinas Valley, and South County Area Plans, and policies relating to air quality are applicable to the AWCP under this plan. Implementation of these policies would reduce air quality impacts in the AWCP area.

Significance Determination

Buildout of the 2007 General Plan within the planning horizon includes increased development and roadway improvements. Construction emissions could potentially result in adverse impacts to air quality. The 2007 General Plan and Area Plan policies set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable. The 2007 General Plan and Area Plan goals and policies summarized above include measures to comply with MBUAPCD's standards and regulations regarding construction emissions.

As described above in the Regulatory Setting section, the MBUAPCD has developed an extensive PM_{10} mitigation program for construction activities. MBUAPCD CEQA guidelines state that regional impacts from ozone precursor emissions in equipment exhaust (NO_X and ROG) have been incorporated into the regional emissions budget. This is a potentially significant impact because PM_{10} emissions could violate air quality thresholds. Mitigation is required to reduce this impact to a level of less than significant.

Mitigation Measure AQ-1:
The County of Monterey will update General Plan policy OS-10.5 as follows:

OS-10.5 The County of Monterey will require that future construction in accordance with the 2007 implement MBUAPCD PM_{10} control measures.

Mitigation Measure AQ-2:
Implement MBUAPCD Mitigation Measures for Off-Road Mobile Source and Heavy Duty Equipment Emissions.

General Plan Policy OS-10.6 will be revised as follows:

The County shall implement MBUAPCD measures to address off-road mobile source and heavy duty equipment emissions as conditions of approval for future development.

Significance Conclusion

In summary, buildout of the 2007 General Plan would result in new development, and increased emissions would result from construction activities. Mitigation Measures AQ-1 through AQ-3 would reduce this impact to a less than significant level.

Buildout

Impact of Development with Policies

Implementation of the 2007 General Plan to the 2092 planning horizon would result in increased construction activity, which would impact air quality by increasing ozone precursor and particulate matter emissions for an area that already exceeds ambient air quality standards. Construction projects may also generate exhaust emissions from primarily diesel fueled equipment. While construction projects are often linear and last for a limited time, localized emissions may be substantial.

2007 General Plan Policies

The same 2007 General Plan and Area Plan goals and policies summarized above under the 2030 planning horizon would also apply to buildout in 2092.

Significance Determination

Buildout of the 2007 General Plan includes increased development and roadway improvements. Construction emissions could potentially result in adverse impacts on air quality. The 2007 General Plan and Area Plan policies include measures to comply with MBUAPCD's standards and regulations regarding construction emissions. Mitigation Measures AQ-1 through AQ-3 are required to reduce this impact to a level of less than significant.

Mitigation Measures

Implement Mitigation Measures AQ-1 and AQ-2..

Significance Conclusion

In summary, buildout of the 2007 General Plan would result in new development, and increased emissions would result from construction activities. Mitigation Measures AQ-1 and AQ-2 are required to reduce this impact to less than significant.

Criteria Pollutants

Impact AQ-3: Net Change in Ozone Precursor (ROG and NOx) and Particulate Matter. (Significant and Unavoidable.)

2030 Planning Horizon

Impact of Development with Policies

Mobile sources are sources of emissions associated with vehicle trips, and include employees, deliveries, and maintenance activities. The primary

operational emissions associated with the proposed project are ozone precursors, CO, particulate matter (PM_{10} and $PM_{2.5}$), and carbon dioxide (CO_2), emitted as vehicle exhaust. Emission of ozone precursors, CO, and particulate matter for existing year (2007) and future year (2030) project conditions were calculated using the EMFAC 2007 model and traffic data provided by the 2007 General Plan traffic engineers. Appendix A describes the methodology and model inputs for existing year, future year, and buildout of the 2007 General Plan. Emissions of CO_2 are analyzed in Section 4.16, Climate Change.

Table 4.7-5 summarizes emissions associated with each project condition. Table 4.7-6 summarizes the differences in emissions between project conditions. As Table 4.7-6 indicates, implementation of the 2007 General Plan would result in net decreases in ROG, NO_X, CO, and $PM_{2.5}$ emissions, while PM_{10} emissions would increase. Vehicular emission rates are anticipated to lessen in future years due to continuing improvements in engine technology and the phasing out of older, higher-emitting vehicles. These decreases in emission rates are sufficient to offset the increases in VMT between existing and 2030 project conditions. PM_{10} emissions are shown to increase slightly with implementation of the proposed project due to increased VMT outpacing the reductions in emission rates that would occur for future conditions relative to existing conditions. However, these increases are below the MBUAPCD threshold of 82 pounds per day.

Table 4.7-5. Criteria Pollutant Emissions from Mobile Sources (pounds per day)

Condition	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
2000	13,875	37,737	225,144	1,656	1,296
2000 With Project	16,737	45,522	271,589	1,997	1,563
2030 With Project	1,223	4,872	26,053	1,072	734
2030 Cumulative	2,048	8,160	43,635	1,796	1,229
2030 Cumulative Buildout	2,697	10,747	57,471	2,365	1,618

Table 4.7-6. Differences in Criteria Pollutant Emissions from Mobile Sources (pounds per day)

Project Condition	Yearly VMT	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Existing	8,162,834	13,875	37,737	225,144	1,656	1,296
2030 Project Increase (2030 With Project - 2000)	369,679	-12,652	-32,865	-199,091	-583	-562
2030 Cumulative	14,290,852	2,048	8,160	43,635	1,796	1,229
Buildout Project Increase (2000 With Project - 2000)	1,683,918	2,862	7,785	46,445	342	267
Cumulative Buildout	18,822,215	2,697	10,747	57,471	2,365	1,618
MBUAPCD Thresholds		137	137	550	82	N/A

In addition to mobile sources, wineries proposed under the AWCP component of the 2007 General Plan would be sources of criteria emissions. According to the EPA, ethanol and carbon dioxide are the primary compounds emitted during the wine making fermentation process (Environmental Protection Agency 2001). Ethanol is a volatile organic compound and is subject to the MBUAPCD's ROG thresholds, while carbon dioxide has no thresholds of significance. Discussions with industry representatives indicate that the harvest in Monterey County generally runs 137 days from August 1 through December 15. 2030 Buildout conditions are described in Table 4.7-2, above. Emissions from a typical single artisan and a typical single full-scale winery are depicted below in Table 4.7-7. Emission factors are available for the fermentation (both red and white wines), pomace screening (red wine only), and pomace press processes. Emission factors for other processes such as storage are not available. The estimate of gallons per year is based on a maximum production of 25,000 cases per year for a typical artisan winery, and 1,500,000 cases per year for a typical full-scale winery.

Table 4.7-7. VOC Emissions for Typical Single Full-Scale and Single Artisan Wineries)

	Emission Factor (lbs/1000 gallons)[1]	Gallons per Year[2]	VOC Emissions (lbs/year)	VOC Emissions (lbs/ day)
Single Artisan Winery				
Fermentation-Red	6.2	23,800	147.56	1.1
Fermentation-White	2.5	35,700	89.25	0.65
Storage/Ageing-Red	0.02783	23,800	662	1.81
Storage/Ageing-White	0.02583	35,700	922	2.53
Pomace Screening-Red	0.5	23,800	11.9	0.09
Pomace Press-Red	0.1	23,800	2.38	0.02
Total			**1,835.09**	**6.2**
Single Full-Scale Winery				
Fermentation-Red	6.2	1,428,000	8,853.6	64.6
Fermentation-White	2.5	2,142,000	5,355	39.1
Storage/Ageing-Red	0.02783	1,428,000	39,741	108.88
Storage/Ageing-White	0.02583	2,142,000	55,328	151.58
Pomace Screening-Red	0.5	1,428,000	714	5.2
Pomace Press-Red	0.1	1,428,000	142.8	1.04
Total			**110,134.4**	**370.37**
MBUAPCD Threshold				**137 lbs/day**

[1]Source: United States Environmental Protection Agency 2001
[2]case = 2.38 gallons

2007 General Plan Policies

The 2007 General Plan and Area Plan goals and policies summarized below set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable.

Open Space and Conservation Element

Open Space and Conservation Element Goal OS-10 provides for the protection and enhancement of Monterey County's air quality without constraining routine and ongoing agricultural activities. Policies OS-10.1 through OS10.11 (land use decisions, mass transit, conservation of vegetated and forested areas, industrial and

commercial development, mixed land use, support of MBUAPCD strategies, use of technology, asbestos, future development) contain measures to improve the County's air quality and encourage sustainable development that utilizes mass transit and energy efficiency, which would result in a reduction in air quality impacts.

Circulation Element

Circulation Element Goal C-2 is to optimize the County's transportation facilities. Policies C-2.1 through C-2.7 include measures to concentrate land-use and reduce overall VMT. Circulation Element Goal C-3 encourages the minimization of negative impacts of transportation on the County. Policies C-3.1 through C-3.5 include measures to protect air quality, reduce fossil fuels, and promote alternate transportation. Circulation Element Goal C-6 entails promoting alternative transportation. Policies C-6.1 through C.6-9 include measures to promote public transportation and infrastructure for public transportation. Goal C-10 and Policies C-10.1 through C-10.7 promote improving the bicycle transportation system, which will reduce impacts to air quality.

Area Plan Policies

The North County Area Plan

North County Area Plan Policy NC-1.2 (mushroom operations) reduces air quality impacts by requiring new development to install environmental control methods for air quality.

Greater Salinas Area Plan

There are no policies applicable to air quality in the Greater Salinas Area Plan.

Central Salinas Valley Area Plan

Central Salinas Valley Area Plan Policy CSV-3.2 (development of renewable energy sources) encourages the development and utilization of renewable energy sources such as solar, wind power generation, and biomass technologies in the Central Salinas Valley. This policy would help reduce air quality impacts by supporting non-polluting energy sources.

Greater Monterey Peninsula Area Plan

Greater Monterey Peninsula Area Plan Policy GMP-2.7 (public transit) would help reduce air quality impacts by encouraging new development to incorporate alternate modes of transportation (buses, bicycles, walking).

Carmel Valley Master Plan

Carmel Valley Master Plan Policy CV-2.1 (circulation) emphasizes the use of public transit, and stresses the importance of pedestrian access in the village, which would allow for reduced air quality impacts through reduction of traffic.

Toro Area Plan

Toro Area Plan Policies T-2.9 and T-2.10 (circulation) would reduce air quality impacts by encouraging new development to incorporate designs to allow for alternate modes of transportation; it also encourages increasing mass transit accessibility for residents.

Cachagua Area Plan

There are no policies applicable to air quality in the Cachagua Area Plan.

South County Area Plan

There are no policies applicable to air quality in the South County Area Plan.

Agricultural Winery Corridor Plan

The AWCP overlays the Toro, Central Salinas Valley, and South County Area Plans, and policies relating to air quality are applicable to the AWCP under this plan. Implementation of these policies would reduce air quality impacts in the AWCP area.

Significance Determination

Implementation of the 2007 General Plan would result in increased emissions of criteria pollutants and VOCs. Implementation of the 2007 General Plan would result in increased mobile and area source emissions due to increased vehicle trips and VMT, and increased development.

As indicated in Table 4.7-5, 2030 conditions (2030 With Project - 2000 conditions) would result in a net decrease in ROG, NO_X, CO, $PM_{2.5}$, and PM_{10} emissions. Vehicular emission rates are anticipated to lessen in future years due to continuing improvements in engine technology and the phasing out of older, higher-emitting vehicles. These decreases in emission rates are sufficient to offset the increases in VMT seen between 2000 and 2030 project conditions, resulting in the decreased ROG, NO_X, CO, $PM_{2.5}$, and PM_{10} emissions observed in Table 4.7-5. Additionally, the 2007 General Plan and Area Plan goals and policies set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable.

The 2007 General Plan and Area Plan policies summarized above include measures to increase the use of public transit and alternate modes of transportation, and to promote sustainable development. The 2007 General Plan also encourages concepts such as sustainable development and preservation of natural areas that would further reduce single passenger vehicle trips. In addition, the MBUAPCD has developed mitigation for commercial, industrial, institutional, and residential land uses, and for alternative fuels. Criteria pollutant impacts (with the exception of VOC emissions from wineries) are considered less than significant with implementation of Mitigation Measures AQ-3 through AQ-5 below. Also, please refer Mitigation Measures CC-2, and CC-3. These policies will add new general plan policies OS-10.12 and OS-10.13, which involve adopting a green building ordinance and promoting alternative energy development. Mitigation Measures CC-2 and CC-3 would further reduce this impact.

As shown above in Table 4.7-7, estimated project-level VOC emissions from individual artisan wineries would be under the MBUAPCD threshold of 137 lbs/day, while emissions from individual full-scale wineries would exceed the threshold. In addition to wine fermentation, emissions occur from wine ageing.

Although the combined VOC production of the wineries would not exceed the 2008 AQMP's forecast emissions inventory, typical full-scale wineries would individually exceed the daily VOC standard (137 pounds per day) and, taken together the 50 new wineries would produce more than 137 lbs/day of VOC emissions, and cumulatively exceed the MBUAPCD's thresholds. To be conservative, this impact is considered considerable.

Substantial amounts of grape juice and must from wine grapes harvested in Monterey County are currently being shipped to Napa County for fermentation and ageing. In concept, implementation of the AWCP would allow much of those products to remain in Monterey County for fermentation and ageing, thereby avoiding the mobile emissions from truck trips to and from Napa County. However, the amount of this offset and its permanence cannot be determined. The San Joaquin Valley is another of California's major wine grape producing areas. There is no way to ensure that the Napa County truck trips avoided by the AWCP would not be replaced by truck trips between the San Joaquin Valley and future Monterey County wineries, should winery capacity and market forces make that economically viable. Because the avoided emissions cannot be quantified with reasonable accuracy, this offset is not considered in the analysis of VOC emissions.

Mitigation Measures

Mitigation Measure AQ-3: Implement MBUAPCD Mitigation Measures for Commercial, Industrial, and Institutional Land Uses (MBUAPCD 2008).

The following measures will be added to General Plan Policy OS-10.10:

- Provide preferential carpool/vanpool parking spaces
- Implement a parking surcharge for single occupant vehicles
- Provide for shuttle/mini bus service
- Provide bicycle storage/parking facilities and shower/locker facilities
- Provide onsite child care centers
- Provide transit design features within the development
- Develop park-and-ride lots
- Employ a transportation/rideshare coordinator
- Implement a rideshare program
- Provide incentives to employees to rideshare or take public transportation
- Implement compressed work schedules
- Implement telecommuting program

Mitigation Measure AQ-4: Implement MBUAPCD Mitigation Measures for Residential Land Uses (MBUAPCD 2008).

General Plan Policy OS-10.10 will be revised to include the following measures to address residential land use:

- Provide bicycle paths within major subdivisions that link to an external network
- Provide pedestrian facilities within major subdivisions

Mitigation Measure AQ-5: Implement MBUAPCD Mitigation Measures for Alternative Fuels (MBUAPCD 2008).

The following measures will be added to General Plan Policy OS-10.2 to address alternative fuels:

- Utilize electric fleet vehicles
- Utilize Ultra Low-Emission fleet vehicles
- Utilize methanol fleet vehicles
- Utilize liquid propane gas fleet vehicles
- Utilize compressed natural gas fleet vehicles

Significance Conclusion

In summary, implementation of the 2007 General Plan would result in a decrease in ROG, NO_X, CO, $PM_{2.5}$, and PM_{10} emissions. The 2007 General Plan and Area Plan goals and policies set forth comprehensive measures to

avoid and minimize adverse impacts on air quality to the maximum extent practicable, and the MBUAPCD has established mitigation measures for operational emissions. Therefore, with the implementation of Mitigation Measures AQ-3 through AQ-5, the impact from criteria pollutants is considered less than significant for most sources.

As seen from Table 4.7-5, the VOC emissions that would occur under 2030 project conditions would exceed the District's threshold of 137 pounds per day. Consequently, VOC impacts from winery operations are considered significant and unavoidable.

There is no feasible mitigation that would reduce these emissions. As noted above, wine making is as much art as science. The San Joaquin Valley Air Pollution Control District (SJVAPCD) established Rule 4694 in December 2005 to regulate VOC emissions from wine fermentation and storage tanks through temperature controls, emissions controls, and process restrictions. (San Joaquin Valley Air Pollution Control District. 2006) However, during preparation of its 2007 Ozone Plan, the SJVAPCD further evaluated whether there is a Reasonably Available Control Technology (RACT) for wine fermentation and storage and found that there is none. Upon research, the SJVAPCD found that Rule 4694 is the only one of its kind in the world. After extensive research into a number of potential approaches, the SJVAPCD concluded that for a variety of reasons, technologically feasible control options are not economically feasible. Accordingly, Rule 4694 is not eligible for inclusion in the State Implementation Plan. (San Joaquin Valley Air Pollution Control District 2007)

Buildout

Impact of Development with Policies

Emission factors are not currently available for future year 2092, and as such a qualitative analysis is required for this condition. As indicated above, buildout of the 2007 General Plan would result in net decreases in ROG, NO_X, CO, $PM_{2.5}$, and PM_{10} emissions. Vehicular emission rates are anticipated to lessen in future years due to continuing improvements in engine technology and the phasing out of older, higher-emitting vehicles. These decreases in emission rates would likely offset the increases in VMT between existing and 2092 project conditions.

2007 General Plan Policies

The same 2007 General Plan and Area Plan goals and policies summarized above under 2030 would also apply to 2092.

Significance Determination

The 2007 General Plan and Area Plan goals and policies set forth comprehensive measures to avoid and minimize adverse impacts on air

quality to the maximum extent practicable. The 2007 General Plan and Area Plan goals and policies summarized above include measures to increase the use of public transit and alternate modes of transportation, and to promote sustainable development. The 2007 General Plan also encourages concepts such as sustainable development and preservation of natural areas that would further reduce single passenger vehicle trips. However, because emission factors are not available for future year 2092, emission levels for 2092 are purely speculative. Therefore, this impact is considered potentially significant and Mitigation Measures AQ-3 through AQ-5 are required.

Mitigation Measures

Implement Mitigation Measures AQ-3, AQ-4, and AQ-5.

Significance Conclusion

In summary, the 2007 General Plan and Area Plan goals and policies set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable. However, there is not sufficient information to determine whether emission levels would exceed thresholds in 2092. Therefore, this impact is considered potentially significant.

Diesel Exposure Health Risk

Impact AQ-4: Buildout of the 2007 General Plan would expose sensitive receptors to increased diesel exhaust. (Less-Than-Significant With Mitigation)

2030 Planning Horizon

Impact of Development with Policies

Within the last decade, health effects studies have demonstrated that toxic air contaminants for which there is no safe exposure level are an equally critical concern. The bulk of this concern is related to diesel particulate matter (DPM) generated by heavy equipment during facility construction and by heavy truck traffic during transportation system operations. DPMs are released in their already toxic form near the source, and then cumulatively disperse throughout the region. They are both a local and a regional issue.

CARB has identified diesel exhaust particulate matter as a toxic air contaminant. However, the assessment of diesel-related cancer risks is typically based upon a 70-year exposure period. Roadway construction activities, especially linear projects, expose receptors to possible diesel exhaust for a very limited number of days out of the "70-year, 365 day per year, 24-hour per day, outside of one's residence" assumption in the overall risk assignment. Because exposure to diesel exhaust will be well below the 70-year exposure period, and exposure will be minimal due to types of proposed projects, construction of any individual project is not anticipated to result in an elevated cancer risk to exposed persons. Consequently, the local

diesel exposure risks associated with construction activities is considered to be less than significant. CARB adopted a new regulation for in-use off-road diesel vehicles in 2008 that applies to off-road diesel fleets and includes measures such as retrofits (CARB 2008).

Local operational DPM impacts around any individual transportation source depend upon the number of diesel sources and the setback distance between the source and the nearest sensitive receivers. Recently developed state and federal guidelines have identified operational characteristics that would be a possible concern. The CARB's recent land use recommendation is that sensitive receptors should not be located any closer than 500 feet of a freeway carrying more than 100,000 vehicles per day. This policy is not included in the 2007 General Plan. EPA/FHWA guidelines do not require a $PM_{2.5}$-diesel hot spot analysis for any roadway that carries less than 10,000 diesel-fueled vehicles per day. These levels of traffic and diesel exhaust are not realized in Monterey County. Transportation projects envisioned with buildout of the 2007 General Plan would reduce idling and queuing at congestion points. Their implementation will reduce diesel exposure by improving system efficiency at existing bottlenecks. While maximizing the setback distances and minimizing truck impacts to any sensitive receptors should be incorporated into the final design of all planned improvements, plan implementation is not expected to worsen air toxics exposures near any plan elements.

Diesel particulate matter exposure is, however, also a regional issue. Exposure in Monterey County is much less than in heavily developed areas of the state with generally poorer dispersion meteorology. Nevertheless, prudent avoidance to cumulative long-term regional diesel exhaust exposure is recommended because there is no absolute safe exposure level to this pollutant. This is a potentially significant impact. Mitigation is required to reduce this impact to a level of less than significant.

2007 General Plan Policies

The 2007 General Plan and Area Plan goals and policies summarized below set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable.

Open Space and Conservation Element

Open Space and Conservation Element Goal OS-10 provides for the protection and enhancement of Monterey County's air quality without constraining routine and ongoing agricultural activities. Policies OS-10.6 (support for MBUAPCD air pollution control strategies, air quality monitoring, and enforcement activities) and OS-10.9 (future development required to implement applicable MBUAPCD control measures) support this goal and reduce air quality impacts by standardizing air quality measures in the County.

Area Plan Policies

The North County Area Plan

North County Area Plan Policy NC-1.2 (mushroom operations) reduces air quality impacts by requiring new development to install environmental control methods for air quality.

Greater Salinas Area Plan

There are no policies applicable to air quality in the Greater Salinas Area Plan.

Central Salinas Valley Area Plan

Central Salinas Valley Area Plan Policy CSV-3.2 (development of renewable energy sources) encourages the development and utilization of renewable energy sources such as solar, wind power generation, and biomass technologies in the Central Salinas Valley. This policy would help reduce air quality impacts by supporting non-polluting energy sources.

Greater Monterey Peninsula Area Plan

Greater Monterey Peninsula Area Plan Policy GMP-2.7 (public transit) would help reduce air quality impacts by encouraging new development to incorporate alternate modes of transportation (buses, bicycles, walking).

Carmel Valley Master Plan

Carmel Valley Master Plan Policy CV-2.1 (circulation) emphasizes the use of public transit, and stresses the importance of pedestrian access in the village, which would allow for reduced air quality impacts through reduction of traffic.

Toro Area Plan

Toro Area Plan Policies T-2.9 and T-2.10 (circulation) would reduce air quality impacts by encouraging new development to incorporate designs to allow for alternate modes of transportation, and also by encouraging increased accessibility for residents to mass transit.

Cachagua Area Plan

There are no policies applicable to air quality in the Cachagua Area Plan.

South County Area Plan

There are no policies applicable to air quality in the South County Area Plan.

Agricultural Winery Corridor Plan

The AWCP overlays the Toro, Central Salinas Valley, and South County Area Plans, and policies relating to air quality are applicable to the AWCP under this plan. Implementation of these policies would reduce air quality impacts in the AWCP area.

Significance Determination

Implementation of the 2007 General Plan within the 2030 planning horizon could potentially result in health risks due to diesel exhaust. Mitigation Measure AQ-6 and AQ-7 would be consistent with the 2008 CARB regulation for in-use off-road diesel fueled fleets, and would reduce this impact to a less than significant level. The 2007 General Plan contains no specific proposals for sensitive land uses near highways carrying 100,000 cars per day or other air pollution sources listed in the *Air Quality and Land Use Handbook: A Community Health Perspective* prepared by the California Air Resources Board in April 2005. Buffers between non-agricultural developments and agricultural fields that might be sources of dust will be required under Policy AG-1.2. Policy LU-2.2 will limit residential development in areas that are unsuited for more intensive development due to physical hazards and development constraints. Therefore, there would be no significant impacts from this quarter.

Mitigation Measure AQ-6: The County of Monterey shall require that construction contracts be given to those contractors who show evidence of the use of soot traps, ultra-low sulfur fuels, and other diesel engine emissions upgrades that reduce PM_{10} emissions to less than 50% of the statewide PM_{10} emissions average for comparable equipment.

Mitigation Measure AQ-7: The following language should be included in General Plan policy OS-10.10:

- Development of new sensitive land uses (schools, hospitals, facilities for the elderly) should not be located any closer than 500 feet of a freeway carrying more than 100,000 vehicles per day.

Significance Conclusion

In summary, buildout of the 2007 General Plan would result in health risks from diesel exhaust. In addition to the above General Plan goals and policies, Mitigation Measures AQ-6 and AQ-7 are required to reduce this impact to less than significant.

Buildout

Impact of Development with Policies

Buildout of the 2007 General Plan to the 2092 planning horizon would result in similar health risk impacts due to diesel exhaust as those described for the 2030 planning horizon.

2007 General Plan Policies

The same 2007 General Plan and Area Plan goals and policies summarized above for 2030 would also apply to 2092.

Significance Determination

Buildout of the 2007 General Plan within the planning horizon would result in health risks due to diesel exhaust. Implementation of Mitigation Measures AQ-6 and AQ-7 will reduce this impact to less than significant.

Mitigation Measures

Implement Mitigation Measure AQ-6 and AQ-7.

Significance Conclusion

In summary, buildout of the 2007 General Plan would result in health risks from diesel exhaust. In addition to the above General Plan goals and policies, Mitigation Measures AQ-6 and AQ-7 are required to reduce this impact to less than significant.

Carbon Monoxide Concentrations

Impact AQ-5: Future traffic growth would cause increases in CO levels along County roadways. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Air quality impacts may occur locally in close proximity to a transportation source from air pollutants that are released in their already unhealthy form. CO exposure in close proximity to major intersections or freeways has traditionally been a local air quality concern. With much cleaner cars and low local background levels, CO hot spot potential has all but disappeared in Monterey County.

2007 General Plan Policies

The 2007 General Plan and Area Plan goals and policies summarized below set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable.

Open Space and Conservation Element

Open Space and Conservation Element Goal OS-10 provides for the protection and enhancement of Monterey County's air quality without constraining routine and ongoing agricultural activities. Policies OS-10.2, 10.4, 10.5, 10.9, and 10.11 all encourage mass transit or alternate modes of transportation, which would help alleviate congestion and delay, both of which lead to CO concentrations. These policies would, therefore, result in a reduction of air quality impacts from CO concentrations.

Area Plan Policies

The North County Area Plan

North County Area Plan Policy NC-1.2 (mushroom operations) reduces air quality impacts by requiring new development to install environmental control methods for air quality.

Greater Salinas Area Plan

There are no policies applicable to air quality in the Greater Salinas Area Plan.

Central Salinas Valley Area Plan

Central Salinas Valley Area Plan Policy CSV-3.2 (development of renewable energy sources) encourages the development and utilization of renewable energy sources such as solar, wind power generation, and biomass technologies in the Central Salinas Valley. This policy would help reduce air quality impacts by supporting non-polluting energy sources.

Greater Monterey Peninsula Area Plan

Greater Monterey Peninsula Area Plan Policy GMP-2.7 (public transit) would help reduce air quality impacts by encouraging new development to incorporate alternate modes of transportation (buses, bicycles, walking).

Carmel Valley Master Plan

Carmel Valley Master Plan Policy CV-2.1 (circulation) emphasizes the use of public transit, and stresses the importance of pedestrian

access in the village, which would allow for reduced air quality impacts through reduction of traffic.

Toro Area Plan

Toro Area Plan Policies T-2.9 and T-2.10 (circulation) would reduce air quality impacts by encouraging new development to incorporate designs to allow for alternate modes of transportation, and also by encouraging increased accessibility for residents to mass transit.

Cachagua Area Plan

There are no policies applicable to air quality in the Cachagua Area Plan.

South County Area Plan

There are no policies applicable to air quality in the South County Area Plan.

Agricultural Winery Corridor Plan

The AWCP overlays the Toro, Central Salinas Valley, and South County Area Plans, and policies relating to air quality are applicable to the AWCP under this plan. Implementation of these policies would reduce air quality impacts in the AWCP area.

Significance Determination

Areas of CO concentration are typically associated with areas of significant traffic congestion. CO emission rates from motor vehicles have been declining and are expected to continue to decline in the future because of CARB's Mobile Source Program, which supports replacement of older, higher emitting vehicles with newer vehicles, and increasingly stringent inspection and maintenance programs. For this analysis, the effects of CO "hot spot" emissions were evaluated through CO dispersion modeling for existing year (2008) and 2030 project conditions using the EMFAC 2007 and CALINE models and traffic data provided by the project traffic engineer.

Table 4.7-8. Projected Carbon Monoxide Levels

Receptor	2008		2030 With Project		2030 Cumulative		Buildout	
	1-hour Average (ppm)	8-hour Average (ppm)	1-hour Average (ppm)	8-hour Average (ppm)	1-hour Average (ppm)	8-hour Average (ppm)	1-hour Average (ppm)	8-hour Average (ppm)
1	20.3	13.8	3.9	3.9	6.7	5.6	7.5	6.1
2	19.5	13.3	3.7	3.8	6.4	5.4	7.2	5.9
3	20.3	13.8	3.9	3.9	6.7	5.6	7.5	6.1
4	20.3	13.8	3.9	3.9	6.7	5.6	7.5	6.1
5	19.5	13.3	3.7	3.8	6.4	5.4	7.2	5.9
6	20.3	13.8	3.9	3.9	6.7	5.6	7.5	6.1
7	22.4	15.0	4.7	4.4	5.8	5.1	7.0	5.8
8	21.5	14.5	4.5	4.3	5.6	5.0	6.8	5.7
9	22.4	15.0	4.7	4.4	5.8	5.1	7.0	5.8
10	22.4	15.0	4.7	4.4	5.8	5.1	7.0	5.8
11	21.5	14.5	4.5	4.3	5.6	5.0	6.8	5.7
12	22.4	15.0	4.7	4.4	5.8	5.1	7.0	5.8
13	25.1	16.7	5.0	4.6	5.8	5.1	7.0	5.8
14	24.1	16.1	4.9	4.5	5.6	5.0	6.8	5.7
15	25.1	16.7	5.0	4.6	5.8	5.1	7.0	5.8
16	25.1	16.7	5.0	4.6	5.8	5.1	7.0	5.8
17	24.1	16.1	4.9	4.5	5.6	5.0	6.8	5.7
18	25.1	16.7	5.0	4.6	5.8	5.1	7.0	5.8
CAAQS Threshold	20	9.0	20	9.0	20	9.0	20	9.0

Table 4.7-8 presents the results of the CO "hotspot" modeling, and indicates that implementation of the 2007 General Plan would reduce CO emissions over existing conditions. Implementation of the 2007 General Plan would not result in violations of the state or the federal 1- or 8-hour CO standards. Consequently, the impact of the 2007 General Plan traffic conditions on ambient CO levels in the Project Area is considered less-than-significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

In summary, implementation of the 2007 General Plan would result in increased concentrations of CO but not above MBUAPCD thresholds. Therefore, this impact is considered less than significant.

Buildout

Impact of Development with Policies

Buildout of the 2007 General Plan to the 2092 planning horizon would result in similar CO concentrations as those described above under the 2030 planning horizon.

2007 General Plan Policies

The same 2007 General Plan and Area Plan goals and policies summarized for 2030 would also apply to 2092.

Significance Determination

As shown above in Table 4.7-8, CO levels would not exceed MBUAPCD thresholds under the buildout of the 2007 General Plan. Although the 2007 General Plan will cause an increase in VMT, the marked increase in system efficiency would offset the relatively minor VMT increase. In addition, vehicles excessively idling at congestion points or traveling at slow, inefficient travel speeds are fuel wasters and create possible air pollution hotspots. The 2007 General Plan buildout will create a substantial reduction in delay idling times and in level of service (LOS) F travel segments. Accordingly, impacts in this regard would be less than significant.

Mitigation Measures

No mitigation beyond the 2007 General Plan policies is necessary.

Significance Conclusion

In summary, buildout of the 2007 General Plan would result in increased concentrations of CO but not above MBUAPCD thresholds. Therefore, this impact is considered less than significant.

Odor Impacts

Impact AQ-6: Buildout of the 2007 General Plan would result in the emission of objectionable odors. (Less-Than-Significant Impact.)

2030 Planning Horizon

Impact of Development with Policies

Buildout of the 2007 General Plan would introduce multiple odor issues. Urban uses would occur in areas currently used for agriculture. Accordingly, it is expected that odors associated with agricultural operations (e.g., chemicals, fertilizers, manure) would be considered objectionable by residents and tenants of new urban development in these areas. In addition, the AWCP would allow up to 10 full scale and 40 artisan wineries along the Winery Corridor. The greatest potential for odor generation could result from anaerobic decomposition of grape waste (pomace). Furthermore, odor impacts from landfills could affect future development.

2007 General Plan Policies

The 2007 General Plan and Area Plan goals and policies summarized below set forth comprehensive measures to avoid and minimize adverse impacts on air quality to the maximum extent practicable.

Open Space and Conservation Element

Open Space and Conservation Element Goal OS-10 provides for the protection and enhancement of Monterey County's air quality without constraining routine and ongoing agricultural activities. Policy OS-10.1 (land use policy and development decisions shall be consistent with the natural limitations of the County's air basins) supports this goal and reduces air quality impacts by protecting the County's air basin.

Public Services Element

The Public Services Element Goal PS-6 is to ensure the disposal of solid waste in a safe and efficient manner. Policy PS-6.2 restricts new and expanded solid waste facilities to areas where potential environmental impacts can be mitigated and where the facilities will be compatible with surrounding land uses. Policy PS-6.3 and PS 6.4 require buffer zones within the vicinity of new, current, and closed landfills, and restricts development within buffer zones to protect public health.

Area Plan Policies

The North County Area Plan

North County Area Plan Policy NC-1.2 (mushroom operations) reduces air quality impacts by requiring new development to install environmental control methods for air quality.

Greater Salinas Area Plan

There are no policies applicable to air quality in the Greater Salinas Area Plan.

Central Salinas Valley Area Plan

Central Salinas Valley Area Plan Policy CSV-3.2 (development of renewable energy sources) encourages the development and utilization of renewable energy sources such as solar, wind power generation, and biomass technologies in the Central Salinas Valley. This policy would help reduce air quality impacts by supporting non-polluting energy sources.

Greater Monterey Peninsula Area Plan

Greater Monterey Peninsula Area Plan Policy GMP-2.7 (public transit) would help reduce air quality impacts by encouraging new development to incorporate alternate modes of transportation (buses, bicycles, walking).

Carmel Valley Master Plan

Carmel Valley Master Plan Policy CV-2.1 (circulation) emphasizes the use of public transit, and stresses the importance of pedestrian access in the village, which would allow for reduced air quality impacts through reduction of traffic.

Toro Area Plan

Toro Area Plan Policies T-2.9 and T-2.10 (circulation) would reduce air quality impacts by encouraging new development to incorporate designs to allow for alternate modes of transportation, and also by encouraging increased accessibility for residents to mass transit.

Cachagua Area Plan

There are no policies applicable to air quality in the Cachagua Area Plan.

South County Area Plan

There are no policies applicable to air quality in the South County Area Plan.

Agricultural Winery Corridor Plan

The AWCP overlays the Toro, Central Salinas Valley, and South County Area Plans, and policies relating to air quality are applicable to the AWCP under this plan. Implementation of these policies would reduce air quality impacts in the AWCP area.

Significance Determination

Odor impacts from landfills could affect future development. However general plan policies require new solid waste facilities to be located in areas where potential impacts can be mitigated. Existing and closed facilities will have buffer zones to prevent incompatible land uses, such as residential development. Odor impacts from landfills are considered less than significant.

Odor impacts from agriculture could also affect future development. The County's "Right to Farm" ordinance requires disclosure of the presence of objectionable agricultural odors and exempts agricultural operations from nuisance lawsuits based on alleged harm from such odors. Enforcement of the Right to Farm ordinance would ensure that the presence of agricultural odors is fully disclosed to perspective residents and tenants. Odors arising from the storage of grape waste from the crushing process (pomace) and from the fermentation process do have the potential to result in significant odor impacts.

The following mitigation is required to reduce odor impacts to less-than-significant levels.

Mitigation Measures

Mitigation Measure AQ-8: The following measures should be added as General Plan Policy OS-10.12:

OS-10.12. Provide for the proper storage and disposal of pomace resulting from winery operations.

- To minimize odors resulting from the storage of pomace, all residue shall be removed from the site or spread in the vineyards as a soil amendment by the winery.
- To prevent complaints resulting from burning of pomace, burning of pomace as a disposal method shall be prohibited.

- All wineries shall incorporate best management practices and technologies to prevent fugitive emissions and odors from escaping the winery during production.

Significance Conclusion

In summary, odors associated with agricultural operations under the 2030 planning horizons would be considered objectionable by residents and tenants of new urban development in these areas. Mitigation measure AQ-8 is required to reduce this impact to less than significant.

Buildout

Impact of Development with Policies

Buildout of the 2007 General Plan to the 2092 planning horizon would result in similar odor impacts as those described above under the 2030 planning horizon.

2007 General Plan Policies

The same 2007 General Plan and Area Plan goals and policies summarized above for 2030 would also apply to 2092.

Significance Determination

Under the 2092 planning horizon, odors associated with agricultural operations under the 2030 planning horizons would be considered objectionable by residents and tenants of new urban development in these areas. Mitigation measures AQ-8is required to reduce this impact to less-than-significant levels.

Mitigation Measures

See Mitigation Measure AQ-9 above.

Significance Conclusion

In summary, odors associated with agricultural operations under the 2092 planning horizon would be considered less than significant with implementation of Mitigation Measure AQ-8.